Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Town of Salina Landfill Site
Sub- Site to the Onondaga Lake NPL Site
Town of Salina, Onondaga County
Site Number 7-34-036

March 2007

New York State Department of Environmental Conservation
ELIOT SPITZER, *Governor*

RECORD OF DECISION

Town of Salina Landfill Site
Sub-Site of the Onondaga Lake Superfund Site
Town of Salina, Onondaga County, New York

New York State Department of Environmental Conservation
and
United States Environmental Protection Agency

March 2007

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Town of Salina Landfill Site, Sub-Site of the Onondaga Lake Superfund Site, Town of Salina, Onondaga County, New York

Superfund Site Identification Number: NYD986913580
EPA Operable Unit 8

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the New York State Department of Environmental Conservation (NYSDEC) and the United States Environmental Protection Agency's (EPA's) selection of a remedy for the Town of Salina Landfill Sub-Site (the "Site"), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601 *et seq*., the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300; and the New York State Environmental Conservation Law (ECL) and Title 6 of the Official Compilation of New York State Codes, Rules and Regulations (NYCRR) Part 375. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Health (NYSDOH) was consulted on the planned remedy and concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

The response action selected in this Record of Decision is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

The response action described in this document addresses hazardous waste materials in the Town of Salina Landfill and the contaminated groundwater associated with the leaching of these materials.

The major components of the selected remedy include the following:

- Excavation of contaminated sediments in the western drainage ditch;
- Construction of groundwater/leachate collection trenches north and south of Ley Creek;
- Consolidation of the excavated sediments and the soils and wastes (from the excavation of the collection trenches) on the landfill areas;
- Construction of 6 NYCRR Part 360 caps over the landfill areas north and south of Ley Creek;
- Lining the drainage ditches located along the northern and eastern borders of the Site;
- Engineered drainage controls and fencing;
- Installation of an on-Site 150,000-gallon storage tank to hold excess water volume stemming from storm events;
- Treatment of the collected contaminated groundwater/leachate at an on-Site treatment plant;
- Discharge of treated effluent to Ley Creek;
- Institutional controls (such as restrictive covenants or environmental easements) to prohibit residential use of Site property and the installation and use of groundwater wells, as well as to protect and ensure the integrity of the caps, groundwater/leachate collection trenches, and engineered drainage controls;
- Maintenance of the caps and groundwater/leachate collection trenches; and
- Long-term monitoring.

The Town of Salina will need to certify the continued effectiveness of the institutional and engineering controls on a yearly basis in an annual report. The certification will need to indicate that the required long-term monitoring is being conducted, identify the required institutional and engineering controls, indicate whether they remain effective for the protection of public health and the environment, and indicate whether they should remain in place.

All excavated sediments and any excavated soils or wastes which have PCB concentrations which equal or exceed 50 mg/kg will be sent off-Site for treatment/disposal at a TSCA-compliant facility. Those sediments and any excavated soils or wastes that have PCB concentrations less than 50 mg/kg will be consolidated underneath the cap on the landfill areas.

Before installing the multilayer caps, the subgrade will be graded to promote drainage and exhibit final slopes between 4% and 33%. The entire cap will then be seeded.

Currently, the limits of the landfill waste encroach on the banks of Ley Creek in several locations. Landfilled waste will be pulled back 30 feet from the northern and southern banks of Ley Creek and 30 feet from the northern banks of OLCC prior to the installation of the groundwater/leachate collection trenches[1]. This landfilled waste will be removed and disposed properly at a permitted off-Site facility if it is characterized as hazardous waste. If it is not characterized as hazardous waste, then the waste will be consolidated onto the landfill. The groundwater/leachate collection trenches will then be installed along the northern and southern banks of Ley Creek at the new limits of the waste. Based upon available data and the conclusion that the groundwater flow from the landfill south of Ley Creek is likely to be influenced by a northwestern flowing gradient to the southern collection trench along Ley Creek, a collection trench along the northern side of OLCC may not be needed. If monitoring data indicates a different flow gradient, then the need for a groundwater collection trench along the north side of the OLCC will be evaluated. Site preparation prior to trench construction will include clearing, grubbing, and removal of trees along the northern and southern banks of Ley Creek. Erosion controls, including silt fencing and/or hay bales will be installed to prevent soil and silt runoff from entering the creek. The existing slopes along the banks will be regraded to provide a suitable work pad for construction of the trench. Contaminated material cut from the banks will be placed under the cap (contingent upon the results of the PCB testing noted above).

The groundwater/leachate collection trenches will be keyed into the clay layer that act as an aquitard between the shallow and deep aquifers at the Site. Where the clay layer is not present or is of insufficient thickness, the leachate collection trenches will be keyed into the dense glacial till. Additional investigation of the permeability of the glacial till will be conducted during the remedial design phase. If the glacial till is

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[1] The northern and southern collection trenches will be approximately 2,900 feet long and 1,260 feet long, respectively.

determined to not be a sufficiently low permeability material, then additional measures (*e.g.*, installation of sheet piling downgradient of the collection trenches) may be implemented to ensure that groundwater flow will not bypass the collection trenches.

Pending further evaluation during design, it is anticipated that the trenches will be installed using the bio-polymer slurry construction technique, which eliminates the need for shoring, dewatering, and personnel working in the trench. A barrier liner will be installed on the downgradient side of the trenches to prevent the inflow of uncontaminated water from Ley Creek. A perforated high density polyethylene (HDPE) pipe will be installed at the bottom of the trenches and a porous media (such as large diameter gravel) will be backfilled. The trenches will be designed such that collected water will flow by gravity through conveyance piping to existing manholes located on the northwestern and eastern parts of the Site. From these manholes, the water will be treated at an on-Site treatment plant.

After the installation of the trenches, the downgradient work areas will be graded for proper drainage and covered with 0.5 foot of topsoil. All areas disturbed by the construction will be revegetated. The trenches will be constructed and buffer areas and the banks of Ley Creek and OLCC will be restored, as appropriate, in compliance with the New York State stream protection ARAR, 6 NYCRR Part 608 Use and Protection of Waters.

The 48-inch abandoned sewer line that runs across the Site will be exposed, broken, and sealed with concrete (or some other suitable material) at the eastern and western borders of the Site, to prevent it from serving as a conduit to convey contaminated groundwater off-Site. In addition, a slip liner will be installed in the 48-inch corregated metal pipe (CMP) culvert located in the eastern part of the Site to prevent contaminated groundwater from leaking into the pipe and discharging to Ley Creek.

Sediments in the western drainage ditch will be excavated and the area restored, allowing for positive drainage of surface water runoff to Ley Creek. The drainage ditches located along the northern and eastern borders of the Site will be lined with a low permeability material. The liner will be covered with either rip rap or soil, depending on the expected surface water velocity. It is estimated that 72,000 square feet of liner (3,600 linear feet by 20 feet wide) will be required. Grading and redirection of the drainage ditches will be conducted as necessary to facilitate installation of the liner. Additionally, surface water will be temporarily rerouted if necessary during the construction. Because the installation of the liner will likely cause the disturbance of wetland areas, mitigation of the affected wetlands is also included under the selected alternative.

During the preliminary remedial design, delineation and evaluation of any wetlands on or adjacent to the Site or impacted by the Site consistent with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989); 40 CFR Part 6, Appendix A: "Statement of Procedures on Floodplain Management and Wetlands Protection," Executive Order 11990: "Protection of Wetlands," and EPA's 1985 "Statement of "Policy on Floodplains/Wetlands Assessments for CERCLA Actions" will be performed. Also, since remedial activities will take place within the 100- or 500-year floodplain, a floodplain assessment consistent with Executive Order 11988: "Floodplain Management," and 40 CFR Part 6, Appendix A will be performed to minimize or avoid the adverse effects of a 500-year event, as well as to protect against the spread of contaminants and the long-term disabling of remedial treatment systems due to flooding events. In addition, the substantive requirements of 6 NYCRR Part 502, Floodplain Management Criteria for State Projects will also need to be met.

A soil gas survey, in addition to what has already been performed at the landfill, to determine the potential for soil vapor intrusion into nearby structures will be performed if determined to be necessary by the New York State Department of Health.

The selected remedy will be designed to not inhibit or impair National Grid's operations on the Site. Coordination with National Grid to identify the location of all of its utility lines, structures and facilities will be done in order to identify design requirements for uninterrupted access by National Grid and to ensure safe construction of the selected remedy.

If the ongoing negotiations between the Town of Salina and Onondaga County related to the utilization of Metropolitan Syracuse Wastewater Treatment Plant (METRO) to treat the collected contaminated groundwater/leachate are successful before the Remedial Design Work Plan is approved for the Site, then the collected leachate and groundwater will be pre-treated on-Site and conveyed to METRO in lieu of undergoing complete treatment at an on-Site treatment facility and discharged to Ley Creek (*i.e.*, Alternative 4 would be implemented).

Because the selected remedy will result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling will be utilized to assess the effects of natural attenuation[2] to attain Maximum Contaminant Levels (MCLs)[3] in the two 30-foot buffer areas associated with Ley Creek and in the buffer area north of OLCC, and to otherwise confirm that the remedy remains protective. If justified by the review, additional remedial actions may be implemented.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. §9621, in that it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under applicable federal and state laws or justifies grounds for their waiver; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment that reduces toxicity, mobility, or volume of contaminated media, as a principal element of the remedy, the contaminated groundwater will be collected and treated.

Because this remedy will result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling would be utilized to assess the effects of natural attenuation to attain MCLs downgradient of the groundwater/leachate collection trenches. If justified by the review, additional remedial actions may be implemented.

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2 Natural attenuation is a variety of physical, chemical and biological processes which, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil and groundwater. These in-situ processes include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction.

3 Drinking-water standards.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- Chemicals of concern and their respective concentrations (see ROD, pages 10-19);
- Baseline risk presented by the chemicals of concern (see ROD, pages 20-25);
- Cleanup levels established for chemicals of concern and the basis for these levels (see ROD, pages 10-19);
- How source materials constituting principal threats are addressed (see ROD, page 19);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, pages 19-20);
- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, page 52);
- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD, page 51); and
- Key factors that led to selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see ROD, pages 45-47).

AUTHORIZING SIGNATURES

MAR 29 2007

Dale A. Desnoyers, Director
Division of Environmental Remediation
New York State Department of Environmental Conservation

Date

3/29/07

George Pavlou, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency

Date

RECORD OF DECISION FACT SHEET

<u>Site</u>

Site name:	Town of Salina Landfill Site
Site location:	Town of Salina, Onondaga County, New York
Listed on the NPL:	December 16, 1994

<u>Record of Decision</u>

Date signed:	March 29, 2007
Selected remedy:	Construction of caps over the landfilled areas; excavation of contaminated sediments; construction of groundwater/leachate collection trenches; consolidation of the excavated sediments and the soils and wastes on the landfill areas; lining drainage ditches; engineered drainage controls; fencing; institutional controls; maintenance of the caps and groundwater/leachate collection trenches; on-Site treatment of the collected leachate/groundwater (contingency remedy of on-Site pretreatment and discharge of pretreated leachate/groundwater to METRO facility for treatment is authorized, if approved prior to finalization of the Remedial Design Work Plan); and long-term monitoring.
Capital cost:	$18,436,000
Annual O&M:	$408,700 annually (7% discount rate for 30 years)
Present-worth cost:	$23.5 Million

<u>Lead Agency</u>	NYSDEC
Primary Contact:	David Tromp, Remedial Project Manager, (518) 402-9786
Secondary Contact:	Michael Komoroske, Section Chief, (518) 402-9814

Support Agency EPA

Primary Contact: Robert Nunes, Remedial Project Manager, (212) 637-4254

Secondary Contact: Joel Singerman, Section Chief, (212) 637-4258

Main PRPs Town of Salina, NY

Waste

Waste type: Volatile organic compounds, semi-volatile organic compounds, PCBs, and heavy metals

Waste origin: Disposal of hazardous wastes that include paint sludge, paint thinner, PCB-contaminated wastes, and contaminated sediment dredged from Ley Creek.

Contaminated media: Groundwater, soil, and sediments

DECISION SUMMARY

Town of Salina Landfill Site
Sub-Site of the Onondaga Lake Superfund Site
Town of Salina, Onondaga County, New York

New York State Department of Environmental Conservation
and
United States Environmental Protection Agency

March 2007

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ATTACHMENTS

SITE NAME, LOCATION, AND DESCRIPTION

In 1994, Onondaga Lake, its tributaries and the upland hazardous substance sites which were found to be releasing or threatening to release contamination to the Lake was added to the EPA's Superfund National Priorities List (NPL). The Town of Salina Landfill[4] is contributing such contamination and, therefore, is considered a "Sub-Site" of the Onondaga Lake NPL site.

The Town of Salina Landfill site, approximately 55 acres in size, is located in the Town of Salina, Onondaga County, New York. It is designated a Class 2 Inactive Hazardous Disposal Waste Site by NYSDEC (New York Registry No. 7-34-036). The Site is bounded by the New York State Thruway to the north and by Route 11 (Wolf Street) to the east. An Onondaga County Resource Recovery Agency Transfer Station is located immediately to the west of the landfill. Ley Creek, a Class B stream, runs through the approximate eastern half of the Site and along the southern border of the approximate western half of the Site. The eastern half of the Site is bounded to the south by the banks of a separate tributary, known as the Old Ley Creek Channel (OLCC). A portion of Ley Creek was moved in the early 1970s to its current location. Landfilled materials have been identified in both north of Ley Creek and south of Ley Creek in the land area located between the current Ley Creek and the OLCC, (*i.e.*, north and south of Ley Creek)[5]. (See Figure 1.)

The sediments, surface waters and banks of Ley Creek under and downstream of the Route 11 bridge, as well as the sediments, surface waters, and banks of the OLCC are collectively a separate Class 2 New York State inactive hazardous waste disposal site known as the "Old Ley Creek Channel Site" (Site Number 734074). Further investigation of the Old Ley Creek Channel site is necessary.

Access to the Site has historically been gained from Route 11. Until March 2000, trespassers could enter the Site on foot or by vehicle. Although one entrance to the Site has a locked gate, it was possible to walk or drive around the gate on another dirt road. Once on the Site, several well-worn paths provide vehicle access to most of the Site. Recently, the Town has attempted to limit access to the Site by placing barriers across the dirt access road. It has also placed signs indicating that no dumping is allowed on-Site.

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[4] Superfund Site Identification Number: NYD986913580.

[5] The landfills are unlined.

A 48-inch abandoned sewer line runs across the Site. A 48-inch corrugated metal pipe (CMP) culvert is located in the eastern part of the Site, and drainage ditches are located along the western, northern, and eastern borders of the Site (see Figure 1). Storm water from the Site drains to Ley Creek via the drainage ditches and the culvert.

The land containing the Site is currently owned by five parties. The Town of Salina owns 29 acres of the Site, comprising approximately the western half of the Site. The eastern part of the Site (from the Town's property line to west of Route 11) is privately owned. East Plaza, Inc. owns the portion of the Site located between the current Ley Creek and old Ley Creek. Onondaga County owns a strip of land trending east-west across the Site. Niagara Mohawk owns a strip of land trending east-west across the Site. The Onondaga County Resource Recovery Agency owns the property immediately west of the Site.

The Salina Landfill is located within an area zoned as an Industrial District. Land located immediately to the south and to the west of the Site is also zoned as an Industrial District. The land directly east of the Site, on the opposite side of Wolf Street, is zoned both as a Highway Commercial District and a One-Family Residential District. The land located to the north of the Site, on the opposite side of the New York State Thruway, is zoned as Open-land District, Planned Commercial District, and One-Family Residential District. Based on the Code of the Town of Salina, land within each zoning district has specific intended uses.

The Town is considering other options to the current industrial zoning of the landfill property. These may include use of the property for passive recreational purposes (park, walking trails, etc.). There is also the potential for commercial development at and around the vicinity of the landfill. Any written proposals submitted to NYSDEC for the future use of the Site will be considered for incorporation into the remedial plans, as appropriate.

The area is served by municipal water.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Town of Salina could not produce records indicating the actual date the Salina Landfill opened. However, in 1962, the Town Board closed the dump known as the "Mattydale Dump" pursuant to a court action. The Mattydale Dump was located in the vicinity of the current town garage off of Factory Avenue, approximately ½ mile to the east of the Site. With the closure of the Mattydale Dump, it is believed that the Town proceeded to work with a Site property owner (East Plaza, Inc.) to start landfill operations at the current location of the Town of Salina Landfill. In the same year, the Town adopted a garbage collection ordinance to regulate the collection of solid waste within the boundaries of the Town and to promote the public health, safety and welfare of the residents.

The Town of Salina established residential refuse districts as early as 1941. As such, the Town Board would solicit bids from independent haulers and enter into a contract each year. Licensing procedures were adopted to monitor the disposal of waste and permits were issued to haulers doing business in the Town. In 1970, periodic checks on the landfill indicated that in addition to waste generated within the Town, additional tonnage was coming from outside areas. The Highway Superintendent reported that the Landfill was reaching capacity and suggested that the boundaries be expanded up to Route 81 or additional property be purchased.

During the period the landfill was open, in addition to accepting municipal solid waste, the landfill also accepted hazardous wastes including paint sludge, paint thinner, polychlorinated biphenyl (PCB)-contaminated wastes, and contaminated sediment dredged from Ley Creek.

In 1971, several complaints were made by the New York State Thruway Authority because refuse was being left uncovered and debris was blowing onto the Thruway. The Thruway Authority requested that the Town cover the landfill. Due to the capacity problems, the Town Board started looking into other solid waste disposal options, such as purchasing additional property to start another landfill, building an incinerator, or using a shredding plant which was being constructed by the City of Syracuse.

Between 1971 and 1974, landfill operations continued with little or no control over the refuse haulers that were dumping in the landfill. Town records indicate that the trucks with permit stickers were on the “honor system” and were not checked for source or quantity of refuse and that only town residents that brought their own refuse to the Landfill were checked. Reaching its capacity, the landfill was officially closed sometime in late 1974 or early 1975, pursuant to an order by NYSDEC.

In 1976, landfill cover specifications were issued by NYSDEC for dirt fill and grading of the Site. However, litigation proceedings commenced between the Town of Salina and the property owner East Plaza, Inc. In 1981, the Town purchased the western portion of the Site (approximately

29 acres) from East Plaza, Inc. Once again, landfill cover specifications were issued for the Site by the NYSDEC in July 1981.

In September 1981, the Town awarded a contract to cover the landfill with a two-foot clay-type soil. Once the soil was placed, the area was hydroseeded to establish a vegetative cover. This project was completed in November 1982. There were no further remedial activities undertaken at the Site thereafter to the present time.

Since that time, a number of investigations have been performed at the Town of Salina Landfill. The investigations have largely been focused on gathering only enough data to determine whether the landfill was a threat to human health and to the environment.

In 1986, NYSDEC and the Onondaga County Department of Health collected three soil samples adjacent to the north bank of Ley Creek along the landfill and four surface water samples from the same stretch of Ley Creek and drainage ditches north and east of the landfill. PCBs were not detected in the water samples, but were detected in the soil samples collected adjacent to Ley Creek.

In 1987, NUS Corporation (on behalf of EPA) collected five soil samples from the main fill area north of Ley Creek and three surface water and sediment samples were collected from Ley Creek as follows – one surface water and one sediment sample were collected from an upstream location in Ley Creek (west of Route 11), one surface water and one sediment sample were collected alongside the landfill (in the drainage swale in the northeast section of the landfill), and one surface water and one sediment sample were collected from just downstream of the landfill in Ley Creek. The soil samples contained polyaromatic hydrocarbon compounds (PAHs), metals, volatile organic compounds (VOCs) and pesticides in low levels, but no PCBs. The surface water and sediment samples collected downstream from the landfill did not contain higher concentrations of contaminants than the samples collected upstream from the landfill.

In 1987, Atlantic Testing (on behalf of NYSDEC) attempted to install three groundwater monitoring wells on-Site. Only one well was completed, as drilling for the other two wells encountered wastes in the form of black oil and petroleum-saturated soil in two boreholes. The soils in these borings contained PCBs, low levels of semi-volatile organic compounds (SVOCs) and dibenzofuran and elevated levels of cadmium, chromium, nickel and zinc. One upgradient monitoring well was installed. The groundwater from this well contained low levels of VOCs and SVOCs, high iron and manganese, but no PCBs.

In 1989, a bioaccumulation study conducted by O'Brien & Gere Co. (on behalf of General Motors Corporation) on fish caught in Ley Creek showed that the fish contained up to 6.8 mg/kg PCBs.

In 1991, during an inspection of the landfill by Ecology and Environment (on behalf of NYSDEC), a leachate outbreak was observed along the northern bank of Ley Creek downgradient of an area within the southwestern corner of the landfill.

In 1994, Ecology and Environment completed a Preliminary Site Assessment (on behalf of NYSDEC). This investigation included the collection of 10 surface water and sediment samples from locations in Ley Creek alongside the landfill, (including one upstream of the landfill) and in the adjacent drainage ditches situated to the north and west of the landfill within the Site. Additionally, five surface soil samples were collected on or around the landfilled area, and three leachate samples were collected from the north bank of Ley Creek (two along the southwestern corner of the landfill, and one near the power lines that pass over Ley Creek). The results indicated low levels of VOCs and SVOCs in the surface water (but no PCBs were detected). PCBs, pesticides, VOCs, and SVOCs were detected in the sediment samples, soil samples, and leachate samples.

In 1994, EPA designated Onondaga Lake, its tributaries, and the upland areas which have contributed or are contributing hazardous substance to the lake (subsites) as a Superfund National Priorities List (NPL) site. In 1997, NYSDEC and EPA jointly notified the Town that the Salina Landfill was a subsite of the Onondaga Lake NPL Site due to releases or the threat of releases of hazardous substance, pollutants or contaminants into the environment.

In 1996, Ecology and Environment prepared a Preliminary Site Assessment Addendum (on behalf of NYSDEC). This supplemental investigation was conducted to provide further information on potential groundwater contamination at the landfill. Five new monitoring wells were installed, developed and sampled in the landfilled area north of Ley Creek. The groundwater from most wells contained low levels of VOCs and SVOCs. A PCB compound was detected in one well at a low concentration. One of the downgradient wells (MW-4) (see Figure 2) contained almost no organic compounds, but did show elevated levels of a number of metals. Two surface water and sediment samples collected by NYSDEC from drainage ditches on-Site indicated PCBs were present in the sediment, but were absent from the surface water.

In 1996, NYSDEC designated the Town of Salina Landfill as a Class 2 Inactive Hazardous Waste Site. This designation means that NYSDEC considers the Site a significant threat to human health and/or the environment, which requires remedial action. This Site was designated a subsite to the Onondaga Lake Superfund Site in June 1997 by NYSDEC and EPA, due to the fact that Site contaminants had migrated to Ley Creek, which flows into the lake.

In 1997, representatives from NYSDEC collected three sediment samples from the OLCC. The results of that sampling show that detectable concentrations of VOCs, SVOCs, and PCBs are present in Old Ley Creek Channel.

The portion of Ley Creek adjacent to the landfill is not part of the Site due to the presence of upstream sources of contamination that need to be addressed. Upstream contaminated surface water and sediments in Ley Creek are currently being investigated under an RI/FS for the General Motors Former Inland Fisher Guide Facility and Ley Creek Deferred Media subsite of the Onondaga Lake site. As is stated in the "Site Description" section above, the sediments, surface waters and banks of Ley Creek under and downstream of the Route 11 Bridge as well as the sediments, surface waters and banks of the OLCC are collectively being addressed as the "Old Ley Creek Channel Site," which is a separate Class 2 New York State inactive hazardous waste disposal site (Site Number 734074) .

On October 29, 1997, the Town of Salina entered into an Order on Consent with the NYSDEC to perform the RI/FS, remedial design, and remedial action for the Site. On November 17, 1997, the Town also entered into a State Assistance Contract under the 1986 Environmental Quality Bond Act of New York State. This contract stated that the Town would be reimbursed 75% of the eligible costs during the RI/FS. This contract may be amended for the remedial design and remedial action costs.

The RI started on June 29, 1998. Two phases of sampling occurred over two summers. An RI report was submitted to NYSDEC by the Town, through its consultants, in May 2000. The report was reviewed by the EPA and NYSDEC, and then revised by the Town's consultants. The RI Report was approved in March 2001. The Town submitted a Draft FS Report in January 2001. The report was reviewed by the EPA and NYSDEC, and then revised by the Town's consultants. The FS Report was approved in May 2002.

In January 2003, NYSDEC and EPA released a Proposed Plan describing the remedial alternatives considered for the Site and identifying the preferred remedy with the rationale for the preference. The primary elements of the preferred remedy included constructing impermeable caps over the landfill areas north and south of Ley Creek, constructing groundwater/leachate collection trenches north and south of Ley Creek, and pumping the collected groundwater/leachate to the Metropolitan Syracuse Wastewater Treatment Plant (METRO) for treatment.

Comments received during the public comment period indicated that Onondaga County has a policy not to accept wastewater from inactive hazardous waste sites for treatment at METRO. The Town of Salina and the County participated in extended negotiations for an agreement to allow the landfill's groundwater/leachate to be treated at METRO (with or without pretreatment). No agreement was reached. Therefore, two on-Site groundwater/leachate treatment alternatives were evaluated in a September 2006 Addendum to the May 2002 Town of Salina Landfill Feasibility Study Report (hereinafter "FS Addendum"). A revised Proposed Plan was released to the public for comment in December 2006.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, FS report, FS Addendum, and Proposed Plans for the Site were made available to the public in both the Administrative Record and information repositories maintained at NYSDEC's Albany and Syracuse offices; Salina Town Hall, 201 School Road, Liverpool, New York; Salina Free Library, 100 Belmont Street, Syracuse, New York; Onondaga County Public Library, Syracuse Branch at the Galleries, 447 South Salina Street, Syracuse New York; and the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. In January 2003, fact sheets were sent to over 240 addressees on the Site mailing list, articles appeared in the local newspapers, and selected mailings of the Proposed Plan were made to local officials and interested parties. A public meeting was held at the Salina Town Hall on January 28, 2003. The public comment period was to have ended on February 12, 2003; however, it was extended to March 14, 2003 at the request of the public.

In December 2006, fact Sheets were sent to over 450 addressees on the Site mailing list, articles appeared in the local newspapers, and selected mailings of the revised Proposed Plan were made to local officials and interested parties. The mailing list includes local citizens, businesses, local, state and federal governmental agencies, media, and environmental organizations. A notice of availability of the above-referenced documents was published in the *Post Standard* on December 30, 2006.

A public meeting was held at the Salina Town Hall, on January 30, 2007. The meeting included presentations by NYSDEC and New York State Department of Health (NYSDOH) officials on the results of the RI/FS and discussions of the preferred remedy. The meeting provided an opportunity for the public to ask questions, discuss their concerns, and provide comment on the Proposed Plan. Approximately 40 people attended the meeting. The public comment period ended February 12, 2007.

The fact sheets, public notices, Proposed Plans, and responses to the comments received at the public meetings and in writing during the public comment periods are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, defines an operable unit as a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the Site. Operable units may address geographical portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

NYSDEC and EPA have currently organized the work for the Onondaga Lake NPL Site into eight Sub-Sites. These Sub-Sites are also considered to be operable units of the NPL Site by EPA.

NYSDEC has already selected a remedy for the Ley Creek Dredgings Sub-Site in a Record of Decision (ROD) concurred on by EPA on February 9, 1998. Construction of the remedy for the Ley Creek Dredgings Sub-Site (excavation of PCB-contaminated soils, on-site disposal under a cap, and off-site treatment/disposal) was completed in August 2001.

On September 29, 2000, a ROD, with EPA concurrence, was signed by New York State for the LCP Bridge Street Sub-Site. The selected remedy includes a combination of excavation and on- and off-site treatment/disposal of contaminated soils and sediments, and the construction of a cap, subsurface barrier wall, and groundwater extraction and treatment system. New York State has negotiated a Consent Order with the potentially responsible party (PRP) for the performance of the design and construction of the selected remedy. The Consent Order was signed on March 21, 2002. Accelerated remedial activities, including excavation and off-site disposal of soil from two parcels contaminated with PCBs, the excavation of approximately 4,000 cy of mercury contaminated soil, and the commencement of soil washing of the excavated mercury contaminated soil, were conducted in 2003 and 2004. The Final Design was approved by NYSDEC in September 2004. All remedial activities, except for the placement of the final cap and restoration of the stream and on-site wetlands, were completed in 2006. A second operable of the LCP Bridge street Sub-Site addresses a distinct groundwater contamination plume associated with the former hydrogen peroxide plant which was located north of the West Flume and the subsite. This groundwater plume is characterized by xylene, a hazardous substance associated with the production of hydrogen peroxide. An RI/FS for the second operable unit is currently underway.

On March 28, 2002, a ROD was issued by NYSDEC and EPA for the Semet Residue Ponds Sub-Site. The selected remedy includes removing the pond residue for recycling the material into RT-12 (a component of driveway sealer) and containing the groundwater to prevent its migration into Tributary 5A and Onondaga Lake. After the remedy was selected, the PRP indicated that the selected remedy may no longer be feasible because of changes in market conditions. Under a Consent Order between NYSDEC and the PRP, a focused FS to evaluate other remedial alternatives was completed in July 2006. NYSDEC and EPA are currently evaluating the options presented in the focused FS report.

A ROD selecting a remedy for the Lake Bottom subsite was issued by NYSDEC and EPA on July 1, 2005. The selected remedy includes dredging an estimated 2.65 million cubic yards of contaminated sediments and isolation capping of an estimated 425 acres in the littoral zone (water depths ranging from 0 to 30 feet), thin layer capping of an estimated 154 acres, an oxygenation pilot study (of the water near the lake bottom) which will be followed by full-scale oxygenation if supported by the pilot study, and monitored natural recovery in the profundal zone (water depths exceeding 30 feet). It is anticipated that the most highly contaminated materials would be treated and/or disposed of off-site. The balance of the dredged sediment would be placed in a Sediment Consolidation Area (SCA). Wastewater generated by the dredging/sediment handling processes as a result of dewatering of the sediments at the SCA would be treated prior to being discharged back to the lake. An Explanation of Significant Differences which describes a change to a portion of the remedy required by the ROD in the southwest portion of the lake was issued by NYSDEC and EPA on December 14, 2006. The change was necessary to ensure the stability of the adjacent causeway and the adjacent area which includes a portion of I-690, and was supported by recent, more extensive sampling of the area which indicates that the pure chemical contamination is significantly less extensive than estimated in the ROD. A Consent Decree related to the performance of the design and construction of the remedy by Honeywell under New York State oversight was entered on January 4, 2007. Pre-design related activities are currently underway.

RI/FSs are currently underway at the following Onondaga Lake NPL Sub-Sites: GM Former Inland Fisher Guide and Ley Creek Deferred Media; Wastebed B/Harbor Brook; and Willis Avenue. These RI/FSs are expected to be completed within the next few years. In addition, Interim Remedial Measure (IRMs) have been or are being conducted at the GM Former Inland Fisher Guide and Ley Creek Deferred Media, LCP Bridge Street, Semet Residue Ponds, Waste Bed B/Harbor Brook, and Willis Avenue Sub-Sites.

The primary objectives of this action are to prevent direct contact (human and wildlife) with the landfill waste, minimize the migration of Site-related contaminants, and minimize any current and potential future health and environmental impacts.

SUMMARY OF SITE CHARACTERISTICS

The purpose of the RI, conducted from 1998 to 2000, was to determine the nature and extent of the contamination at and emanating from the Site. The results of the RI are summarized below and in Table 1.

Groundwater

Groundwater underlying the Site is found in two water-bearing units. The uppermost water-bearing unit is unconfined. The water table ranges from four to 22 feet below grade and is present either within the waste or in the uppermost sand unit. (See Figure 5.) The lower water-bearing unit is under confined conditions and is present in the lower sand unit, above the till. In fact, the conditions are such that one groundwater monitoring well, screened in the lower sand unit, was a free-flowing artesian well.

Groundwater samples were collected from a total of seventeen permanent monitoring wells on-Site, including fourteen shallow wells, and three deep wells. (See Figure 2.)

The groundwater that appears to be most heavily impacted is located in the shallow aquifer in the southeast portion of the main landfilled area north of Ley Creek. Monitoring well MW-10 (see Figure 2) is the most heavily contaminated, with elevated concentrations relative to NYSDEC standards or guidance values of benzene (29 micrograms per liter [μg/l]; the groundwater standard is 1 μg/l), toluene (92,774 μg/l; the groundwater standard is 5 μg/l), ethylbenzene (3,100 μg/l; the groundwater standard is 5 μg/l), and xylenes (17,900 μg/l; the groundwater standard is 5 μg/l), as well as elevated concentrations of chlorinated solvents, such as trichloroethene (11,138 μg/l; the groundwater standard is 5 μg/l), 1,2-dichloroethene (3,100 μg/l; the groundwater standard is 5 μg/l), 1,1,1-trichloroethane (2,822 μg/l; the groundwater standard is 5 μg/l), tetrachloroethane (75 μg/l; the groundwater standard is 5 μg/l), and vinyl chloride (1,059 μg/l; the groundwater standard is 2 μg/l). Other wells in the southeastern vicinity of MW-10, including MW-6, MW-7, MW-8 and MW-9, contained a number of volatile organic compounds that exceed water quality standards or guidance values.

Four monitoring wells (MW-8, MW-9, MW-10 and MW-15) contained semi-volatile organic compounds that exceeded standards, 1,2-dichlorobenzene (5 μg/l; the groundwater standard is 3 μg/l), 1,4-dichlorobenzene (10 μg/l; the groundwater standard is 3 μg/l), bis(2-ethylhexyl)phthalate (17 μg/l; the groundwater standard is 5 μg/l), and naphthalene (36 μg/l; the groundwater guidance value is 10 μg/l). The groundwater in four monitoring wells (MW-7, MW-10, MW-12 and MW-15) also contained a few pesticides, BHC-alpha (0.011 μg/l; the groundwater standard is 0.01 μg/l) and endrin (0.014 μg/l; the groundwater standard is “non-detect”).

PCBs (Aroclor 1248) were detected in six monitoring wells (MW-1, MW-5, MW-6, MW-8, MW-9 and MW-15) in excess of water quality standards or guidance values (maximum concentration of 1.6 μg/l; the groundwater standard is 0.09 μg/l).

The metals that exceed groundwater standards, the maximum detections, and the applicable groundwater standards include arsenic (73.6 μg/l; the groundwater standard is 25 μg/l), aluminum (32,444 μg/l; the groundwater standard is 2,000 μg/l), cadmium (34 μg/l; the groundwater standard is 5 μg/l), chromium (309 μg/l; the groundwater standard is 50 μg/l), iron (56,000 μg/l; the groundwater standard is 300 μg/l), magnesium (129,160 μg/l; the groundwater standard is 35,000 μg/l), manganese (7,633 μg/l; the groundwater standard is 300 μg/l) and sodium (1,256,700 μg/l; the groundwater standard is 20,000 μg/l). In general, the highest concentrations of iron, magnesium, and manganese are present in the wells with the highest turbidity. It should be noted that the sodium and chloride concentrations are particularly elevated in well MW-5D. These parameters, as well as elevated concentrations of total dissolved solids and specific conductance, may indicate that the groundwater is slightly brackish.

Review of the leachate indicator data from the monitoring wells indicates that most of the shallow wells have been impacted by the landfill. The ratio of alkalinity to sulfate can be used to show leachate impacts and the majority of the shallow wells show high alkalinity/sulfate ratios. Alternatively, the deep wells have a low alkalinity/sulfate ratio, indicating that they have not been impacted by leachate. This evaluation is supported by the presence of elevated levels of nitrogen compounds (ammonia and Total Kjeldahl Nitrogen [TKN]) and total organic carbon (TOC) in the shallow wells, but absence or low concentrations of these compounds in the deep wells. The groundwater in the confined aquifer was almost entirely free of organic compounds. The only exception was upgradient well MW-0D, which contained 2 μg/l of butyl benzyl phthalate (the groundwater guidance value is 50 μg/l). The stratigraphical information and information on contaminant distribution within monitoring wells MW-12 and MW-12D indicate that the two aquifers are not interconnected.

Water samples were also collected from seven temporary wells that were installed in the water table aquifer along the northern bank of Ley Creek. The wells were installed to help define groundwater flow direction and to aid in the understanding of the interconnection between groundwater and surface water. Three of the seven wells were installed immediately upgradient of active leachate seeps. The results show high alkalinity/sulfate ratios and elevated concentrations of ammonia, TKN, and TOC. These results would appear to confirm that groundwater immediately adjacent to Ley Creek is impacted by landfill leachate.

Leachate

Three leachate samples were collected from the northern bank of Ley Creek (see Figure 3). The organic compounds that exceeded Class GA groundwater standards, the maximum detections, and the applicable groundwater standards included benzene (4 μg/l; the groundwater standard is 1 μg/l), chlorobenzene (22 μg/l; the groundwater standard is 5 μg/l), and Aroclor 1248 (1.0 μg/l; the groundwater standard is 0.09 μg/l). The metals that exceeded groundwater standards, the maximum detections, and the applicable groundwater standards included aluminum (12,131 μg/l; the groundwater standard is 2,000 μg/l), barium (1,502 μg/l; the groundwater standard is 1,000 μg/l), chromium (126 μg/l; the groundwater standard is 50 μg/l), iron (156,090 μg/l; the groundwater standard is 300 μg/l), lead (199 μg/l; the groundwater standard is 25 μg/l), magnesium (69,371 μg/l; the groundwater standard is 35,000 μg/l), manganese (1,001 μg/l; the groundwater standard is 300 μg/l), and sodium (190,190 μg/l; the groundwater standard is 20,000 μg/l).

Surface Water

Surface water samples were collected from six locations (see Figure 3). Organic compounds were detected in 2 of the samples. The parameters that were detected, the maximum concentrations, and the applicable water quality standards or guidance values were benzo(k)fluoranthene (10 μg/l; the water quality guidance value is 0.002 μg/l) and Aroclor 1248 (0.14 μg/l; the water quality standard is $1x10^{-6}$ μg/l). Although there appear to be upstream sources of Aroclor 1248, the Site may be a potential source since it was detected in samples collected in Ley Creek alongside the landfill.

The parameters that were detected, the maximum concentrations, and the applicable water quality standards for the metals that exceeded water quality standards for Class B waters were aluminum (238 μg/l; the water quality standard is 100 μg/l) and iron (702 μg/l; the water quality standard is 300 μg/l). These compounds were found in all of the samples. Both metals showed a trend of increasing concentrations with increasing distance downstream. The increase in concentration of the metals between the 48-inch storm water discharge pipe and the drainage ditch along the western border of the landfill indicates that groundwater flowing into the landfill and through the Site that seeps into Ley Creek impacts stream water quality. Cyanide was detected in three of the six samples in excess of the standards or guidance values for Class B waters (13.6 μg/l, 13.6 μg/l, and 18.6 μg/l; the standard is 5.2 μg/l). The analytical results for surface water are summarized in Table 1.

Sediment

At each surface water sample location, two sediment depths were targeted for collection—one from 0-6 inches below the sediment/water interface and a second from 6-12 inches below the interface. A sediment sample was selected upstream of the Site in Ley Creek (see Figures 3 and 4). With regard to VOCs, most of the sediment samples contained acetone (0.014 milligrams per kilogram [mg/kg] to 0.078 mg/kg) and three samples contained methylene chloride 0.003 mg/kg, 0.004 mg/kg, and 0.007 mg/kg). All of the Ley Creek samples contained numerous SVOCs in excess of New York State sediment criteria. The predominant SVOCs present in the sediments were PAHs. The PAHs detected above sediment criteria with their maximum concentrations were anthracene (2.55 mg/kg;

the Site-specific sediment criterion[6] is 0.23 mg/kg), benzo(a)anthracene (9.1 mg/kg; the Site-specific sediment criteria is 0.0028 mg/kg), benzo(a)pyrene (7.45 mg/kg; the Site-specific sediment criterion is 0.0028 mg/kg), benzo(b)fluoranthene (11.7 mg/kg; the Site-specific sediment criterion is 0.0028 mg/kg), benzo(k)fluoranthene (2.200 mg/kg; the Site-specific sediment criterion is 0.0028 mg/kg), chrysene (10.15 mg/kg; the Site-specific sediment criterion is 0.0028 mg/kg), fluoranthrene (19.15 mg/kg; the Site-specific sediment criterion is 2.195 mg/kg), fluorene (4.1 mg/kg; the Site-specific sediment criterion is 0.017 mg/kg), indeno(1,2,3-cd)pyrene (3.2 mg/kg; the Site-specific sediment criterion is 0.0028 mg/kg), phenanthrene (9.5 mg/kg; the Site-specific sediment criterion is 0.258 mg/kg), and pyrene (23.7 mg/kg; the Site-specific sediment criterion is 2.068 mg/kg). In most cases, the uppermost sample was 1.5 to two times higher in concentration compared to the deeper sample, with one location as the exception.

There were no pesticides detected in the sediments. PCBs (Aroclors 1248 and 1260) were detected in every sample in high concentrations (ranging from 3.6 mg/kg to 81mg/kg), with the exception of the sediment samples collected from the drainage ditch paralleling the New York State Thruway where PCBs were not detected. The Site-specific sediment screening criterion for PCBs is 0.0000017 mg/kg. The upstream sample location had PCB concentrations of 51.3 mg/kg and 49.7 mg/kg (shallow and deep, respectively). This upstream Ley Creek sample indicates that PCBs emanate from an upstream source. Ley Creek, and its PCB contamination will be addressed as part of the Old Ley Creek Channel Site.

A number of metals, including arsenic, cadmium, chromium, lead, nickel, silver, and zinc, were present in the sediments in excess of sediment criteria in virtually all samples except the sediment samples collected from the drainage ditch paralleling the New York State Thruway. The metals that were detected, the maximum detections, and the associated sediment criteria are manganese (1,133 mg/kg; the sediment criterion is 460 mg/kg), arsenic (25.7 mg/kg; the sediment criterion is 6.0 mg/kg), cadmium (83.7 mg/kg; the sediment criterion is 0.6 mg/kg), chromium (1,767 mg/kg; the sediment criterion is 26.0 mg/kg), nickel (363 mg/kg; the sediment criterion is 16.0 mg/kg), silver (8.7 mg/kg; the sediment criterion is 1.0 mg/kg), and zinc (1,185 mg/kg; the sediment criterion is 120.0 mg/kg). The concentrations for chromium and zinc in the

6 NYSDEC's sediment screening values are specified in its Division of Fish and Wildlife, Division of Marine Resources, *Technical Guidance for Screening Contaminated Sediments*, November 1999. The sediment screening values for the organics have been corrected for the average organic carbon content for the Site, which makes them site-specific.

downgradient samples were significantly higher than upstream concentrations, indicating that the contamination in the landfill could be contributing to the contamination of the sediments in Ley Creek. The analytical data for sediment are summarized in Table 1

Data from previous investigations at the landfill show PCBs and metals above sediment criteria in the drainage ditch west of the landfill which is located in a wetland. Cadmium concentrations ranged from not detected to 7.2 mg/kg; the criterion is 0.6 mg/kg. Lead concentrations ranged from not detected to 151 mg/kg; the criterion is 31 mg/kg.

Soil

The uppermost soils encountered over most of the Site consist of silt and clay and represent the soil cover placed over the waste in 1982. This uppermost layer is approximately 2 feet thick. The soil cover overlies landfilled waste. The waste is thickest on the western portion of the Site and thins to the east. Across the western portion of the landfill, the waste overlies a layer of clay varying in thickness from six to 40 feet. A discontinuous layer of sand appears between the waste and clay layer along the southern and eastern portions of the Site. A silt and sand unit up to 20 feet thick underlies this clay layer over most of the Site. This silt and sand unit overlies a sand unit up to 25-feet thick that appears to dip slightly to the west. A dense glacial till is present beneath the sand unit. The landfill appears to lie in a trough, as the till is found within 10 feet of the surface on the south side of Ley Creek, but is approximately 60 feet below grade in boring B-11 (see Figure 5).

The guidance used for the evaluation of contaminant concentrations in soil are the New York State Department of Environmental Conservation, Division's January 24, 1994 Technical and Administrative Guidance Memorandum 4046: Determination of Soil Cleanup Objectives and Cleanup Levels (TAGM) objectives.

- **Surface Soil**

Twenty-nine surface soil samples were collected on and around the Site. Methylene chloride was the only VOC detected, but at 0.001 mg/kg, it was not above the TAGM objective of 0.1 mg/kg. As with the sediments, the predominant SVOCs were PAHs, and these compounds were detected in every sample. The concentrations of SVOCs are depicted in Figure 6. The PAHs that were detected above standards with their maximum concentrations were: benzo(a)anthracene (8.3 mg/kg; the TAGM objective is 0.224 mg/kg), benzo(a)pyrene (5.2 mg/kg; the TAGM objective is 0.061 mg/kg), benzo(b)fluoranthene (13.9 mg/kg; the TAGM objective is 1.1

mg/kg), benzo(k)fluoranthene (3.7 mg/kg; the TAGM objective is 1.1 mg/kg), chrysene (8.3 mg/kg; the TAGM objective is 0.4 mg/kg), dibenz(a,h)anthracene (0.96 mg/kg; the TAGM objective is 0.014 mg/kg), and indeno(1,2,3-cd)pyrene (3.9 mg/kg; the TAGM objective is 3.2 mg/kg). The highest concentrations of PAHs were detected in the samples collected over most of the landfill surface north of Ley Creek. A number of pesticides were detected in three samples, but none were in excess of the TAGM objectives. Aroclor 1248 was detected in two surface soil samples (0.22 mg/kg and 8.4 mg/kg; the TAGM objective is 1 mg/kg at the surface, 10 mg/kg in the subsurface), which are both located on the parcel between OLCC and Ley Creek. Aroclor 1248 was detected in one surface soil sample at a concentration of 8.4 mg/kg, which exceeds the TAGM objective of 1 mg/kg for surface soils. The sample was collected from the parcel between OLCC and Ley Creek.

Evaluation of the metals data shows that almost all metals concentrations exceeded TAGM objectives in every sample. In many cases, the metals concentrations in the samples collected on top of the landfill were present in concentrations only slightly above background. The notable exception was sample SS-16 which had a copper concentration 47 times the background level, a zinc concentration 32 times the background level, a chromium concentration seven times the background level, and a nickel concentration five times the background level. Also, one sample had a mercury concentration 103 times the TAGM objective and sample SS-15 had a lead concentration 65 times the background. The metals detected above standards with their maximum concentrations and background levels were: aluminum (13,000 mg/kg; background is 10,475 mg/kg), arsenic (7 mg/kg; background is 1.1 mg/kg), barium (530 mg/kg; background is 61.85 mg/kg), cadmium (17.3 mg/kg; background is 1 mg/kg), calcium (119,000 mg/kg; background is 10,845 mg/kg), chromium (116 mg/kg; background is 10 mg/kg), cobalt (17 mg/kg; background is 8.55 mg/kg), copper (860 mg/kg; background is 18.45 mg/kg), iron (19,800 mg/kg; background is 2,000 mg/kg), lead (1,163 mg/kg; background is 18.75 mg/kg), magnesium (20,200 mg/kg; background is 6,580 mg/kg), manganese (557 mg/kg; background is 492 mg/kg), mercury (2.6 mg/kg; background is 0.1 mg/kg), nickel (70 mg/kg; background is 13 mg/kg), potassium (2,872 mg/kg; background is 903.5 mg/kg), selenium (23 mg/kg; background is 2 mg/kg), silver (8 mg/kg; background is 2 mg/kg), sodium (875 mg/kg; background is 108.25 mg/kg), thallium (3.6 mg/kg; background is 1.1 mg/kg), vanadium (22 mg/kg; background is 21.15 mg/kg), and zinc (1,733 mg/kg; background is 20 mg/kg). The analytical data for soil are summarized in Table 1.

- **Subsurface Soil**

Eight subsurface soil samples were collected from test pits during the waste area investigation. The sample from one test pit was collected from a black oily sludge with a strong petroleum odor. The samples from four test pits were collected near this test pit in an attempt to determine the extent of the black oily sludge. One sample was collected from a very compact yellow sandy material, with no odor. Another sample was collected from a dark stained soil, near where the original sanitary sewer line connected to the current sewer line. The samples from other test pits were collected from soils in contact with the original sanitary sewer line that crossed the Site. The analytical data for soil collected from test pits are summarized in Table 1.

A number of VOCs were detected in the subsurface soil samples. In particular, one sample had 0.377 mg/kg of 1,1-dichloroethane (the TAGM objective is 0.200 mg/kg) and 0.766 mg/kg of 1,2-dichloroethene (total) (the TAGM objective is 0.300 mg/kg). One sample contained a relatively high concentration of total xylenes (45.362 mg/kg; the TAGM objective is 1.200 mg/kg) and toluene (147.949 mg/kg; the TAGM objective is 1.500 mg/kg). Other soil samples contained 2-butanone (maximum concentration of 0.420 mg/kg; the TAGM objective is 0.300 mg/kg) and acetone (maximum concentration of 1.600 mg/kg; the TAGM objective is 0.200 mg/kg). As with the surface soil samples, the subsurface soil samples all contained PAHs as the predominant subclass of SVOCs present in excess of TAGM objectives. The PAHs detected above TAGM objectives with their maximum concentrations and the TAGM objectives were: benzo(a)anthracene (16.000 mg/kg; the TAGM objective is 0.224 mg/kg), benzo(a)pyrene (11.700 mg/kg; the TAGM objective is 0.061 mg/kg), benzo(b)fluoranthene (22.0 mg/kg, the TAGM objective is 1.1 mg/kg), benzo(k)fluoranthene (8.6 mg/kg; the TAGM objective is 1.1 mg/kg), chrysene (15.4 mg/kg; the TAGM objective is 0.4 mg/kg), dibenz(a,h)anthracene (1.5 mg/kg; the TAGM objective is 0.014 mg/kg), and indeno(1,2,3-cd)pyrene (5.2 mg/kg; the TAGM objective is 3.2 mg/kg). The subsurface soil samples did not contain pesticides but all samples contained PCBs. The samples from four test pits contained Aroclor 1248 in excess of the TAGM objective, the highest being 420 mg/kg (the TAGM objective is 10 mg/kg).

Again, as with the surface soil samples, virtually all of the metals in all of the samples exceeded TAGM objectives. However, the metals concentrations were generally within one to two times background concentrations. The exceptions were the samples from three test pits (collected along the edge of the creek, immediately north of the confluence of Ley Creek and the OLCC), where metals concentrations ranged from two to 250 times background concentrations. In particular, the concentrations of chromium and cyanide were significantly higher than both background concentrations and the concentrations found in other areas of the landfill. The metals detected above standards with their maximum concentrations were: aluminum (20,587 mg/kg; background is 10,475 mg/kg), antimony (22.0 mg/kg; background is 1.625 mg/kg), arsenic (20.8 mg/kg; background is 1.1 mg/kg), barium (251 mg/kg; background is 61.85mg/kg), cadmium (34.5 mg/kg, the background is 1 mg/kg), calcium (69,118 mg/kg; background is 10,845 mg/kg), chromium (4,265 mg/kg; background is 10 mg/kg), cobalt (16.1 mg/kg; background is 8.55 mg/kg), copper (3,273 mg/kg; background is 18.45 mg/kg), iron (39,078 mg/kg; background is 2,000 mg/kg), lead (418 mg/kg; background is 18.75 mg/kg), magnesium (23,336 mg/kg; background is 6,580 mg/kg), manganese (1,922 mg/kg; background is 492 mg/kg), mercury (0.87 mg/kg; background is 0.1 mg/kg), nickel (1,400 mg/kg; background is 13 mg/kg), potassium (2,722 mg/kg; background is 903.5 mg/kg), selenium (15.0 mg/kg; background is 2 mg/kg), silver (10.1 mg/kg; background is 2 mg/kg), sodium (1,927 mg/kg; background is 108.25 mg/kg), thallium (4 mg/kg; background is 1.1 mg/kg), vanadium (46.3 mg/kg; background is 21.15 mg/kg), and zinc (1,325 mg/kg; background is 20 mg/kg). It is likely that these elevated concentrations of metals in this area are predominantly the result of historical waste disposal in the area rather than an upstream source.

It is important to note that while the subsurface soil samples collected adjacent to the former sanitary sewer contained elevated levels of certain contaminants, there was no evidence of coarse-grained bedding material around the sewer. It appeared that the sewer was placed in native soils. Based on these direct visual observations, it appears unlikely that the material surrounding the sewer has, or will act as a preferred pathway for contaminant migration. However, it is unknown whether the interior of the sewer can act as a pathway.

In addition to the test pits, samples were collected from two soil borings at varying depths and analyzed for inorganic compounds. Several of the metal concentrations exceeded the background values, but virtually all metal concentrations were within one to 2 times the background concentrations, except selenium which was approximately three times the background. The samples collected from these borings were also analyzed to determine the feasibility of using bioremediation as a remedial alternative for soil in the vicinity of MW-10 (see Figure 2). (Bioremediation was determined to not be feasible based upon the tests due to the nature of the wastes present.) Two borings were also drilled in the middle of Ley Creek to determine if waste was present beneath the bed of the creek. No waste was found in these borings. The analytical data for soil collected from soil borings are summarized in Table 1.

Biota

The analytical results for earthworm bioassays indicate that metals are the most common contaminant class in earthworms. The metals that were detected at levels of concern were chromium, copper, lead, mercury and zinc. Only two SVOCs were detected: 4-methylphenol and di-n-butyl phthalate. Since the earthworm samples were composited into one sample in order for the laboratory to perform the required analyses, no trends across the Site could be established.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described below. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

No principal threat wastes have been identified at the Site.

A conceptual site model[7] is depicted in Figure 7.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Salina Landfill is located within an area zoned as an Industrial District. Land located immediately to the south and to the west of the Site

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[7] A conceptual site model illustrates contaminant sources, release mechanisms, exposure pathways, migration routes, and potential human and ecological receptors.

is also zoned as an Industrial District. The land directly east of the Site, on the opposite side of Wolf Street, is zoned both as a Highway Commercial District and a One-Family Residential District. The land located to the north of the Site, on the opposite side of the New York State Thruway, is zoned as an Open-Land District, a Planned Commercial District, and a One-Family Residential District.

Based on a number of factors, including the reported history of land use in the area of the Site and the existing zoning for the Site property, NYSDEC has determined that the reasonably-anticipated future use for the Site is industrial.

The Town is considering other options to the current industrial zoning of the landfill property. These may include use of the property for passive recreational purposes (park, walking trails, etc.). There is also the potential for commercial development at and around the vicinity of the landfill.

Currently, the on-Site aquifers are not used for drinking water. Residents located in the vicinity of the Site use the public water supply provided by Onondaga County. Groundwater near the Site will not be used as a source of potable water under future-use scenarios.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimates the human health and ecological risks which could result from the contamination at the Site if no remedial actions were taken. Due to the historical operations at the Site, and given the heavily industrialized nature of the surrounding area, the Site is expected to continue to remain an industrial property.

Human Health Risk Assessment

A Superfund human health risk assessment estimates the “baseline risk.” This is an estimate of the likelihood of a health problem occurring if no clean up actions were taken at a site. To estimate this baseline risk at a Superfund site, a four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: The hazard identification step identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence and concentration.

Exposure Assessment: Under this step, the different ways that people might be exposed to the contaminants identified in the previous step, the concentrations that people might be exposed to, and the potential frequency and duration of exposure are considered. Using this information, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur is calculated.

Toxicity Assessment: The toxicity assessment determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response).

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 10^{-6} being the point of departure. For noncancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur.

The human-health estimates summarized here are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative estimates about the frequency and duration of an individual's exposure to the COCs in the various media that would be representative of site risks, as well as the toxicity of these contaminants. As was noted above, the current land use of the property is industrial/commercial, and it is not anticipated that the land use will change in the future.

Tables 2 through 8 present the contaminants of concern, their associated concentration in each medium, their frequency of detection, and screening results. The results of the screening of the potential exposure pathways are included in Table 9. Exposure pathways considered for the baseline risk assessment included:

Current and future land use scenarios by trespassers:

- Exposure to surface soils via ingestion;
- Exposure to surface soils via dermal contact;
- Exposure to leachate via ingestion; and
- Exposure to leachate via dermal contact.

Future exposure pathways for on-Site construction workers:

- Exposure to surface soil via ingestion;
- Exposure to surface soil via dermal contact;
- Exposure to subsurface soil via ingestion;
- Exposure to subsurface soil via dermal contact; and
- Exposure to groundwater via incidental ingestion.

A summary of the toxicity assessment is provided in Tables 10 and 11.

The results of the risk assessment indicate that the estimated excess cancer risks for the child trespasser (considering exposures to surface soil and leachate) in both the current and future land-use scenarios were 1.4×10^{-4}. This value represents the upper bound of EPA's acceptable risk range. The largest portion of this cumulative risk is from dermal contact with surface soil. The COCs contributing to the cancer risk for child trespassers are benzo(a)pyrene and benzo(b)fluoranthene for surface soil, and Aroclor 1248 for leachate. The estimated excess cancer risks for the adult trespasser (also considering exposures to surface soil and leachate) were within EPA's acceptable risk range.

The estimated HIs for the combined surface soil and leachate pathways were calculated as 0.026 and 0.0048 for the child and adult trespassers respectively. Thus, there does not appear to be a potential risk for noncancer health effects to these receptors under current conditions.

The cumulative cancer risk (1.2×10^{-4}) for the construction worker in the future land-use scenario (through exposures to surface soil, subsurface soil, and groundwater) represents the upper bound of EPA's acceptable risk range. The largest portion of this risk is attributable to ingestion of and dermal contact with subsurface soil. Some of the COCs that contributed most significantly to the construction worker cancer risk were benzo(a)pyrene, benzo(b)fluoranthene, Aroclor 1248, and arsenic.

The estimated HI for the construction worker in the future land-use scenario was in excess of 1.0 (1.7). This value represents the cumulative effect of exposure to surface soil (ingestion and dermal contact), subsurface soil (ingestion and dermal contact), and groundwater (incidental ingestion only) at the Site in the future. The groundwater route represents the largest portion of the cumulative noncarcinogenic risk to construction workers. Thus, there appears to be a potential risk for noncancer health effects to this receptor in the future. The major COCs identified as contributing to the increased noncarcinogenic risk for construction workers were arsenic (for surface soil and subsurface soil), and arsenic, cadmium, and 1,2-dichloroethene (total) for groundwater.

Tables 12 through 14 provide risk assessment summary information for the three potential human health receptors at the Site (*i.e.*, child trespasser, adult trespasser, and construction worker).

Ecological Risk Assessment

Based on the results of this ecological risk assessment, the contamination at the Site poses a risk to soil invertebrates (worms) and terrestrial vertebrates (soil invertebrate-feeding birds and mammals). Specifically, using maximum contaminant concentrations in surface soil, a risk was calculated for soil invertebrates from total PAHs, chromium, copper, lead, mercury, and zinc. Using mean contaminant concentrations, a risk was calculated for soil invertebrates from chromium, copper, mercury, and zinc (see Table 15. Using the mean concentrations, chromium had the highest hazard quotient[8] (HQ=118), while copper, mercury, and zinc had lower quotients (HQs ranging from 1.1 to 6.3). Toxicity values for soil invertebrates were not available for many other contaminants present in Site surface soils, particularly, many PAHs, bromoform, 4-chloroaniline, bis(2-ethylhexyl)phthalate, Aroclor 1248, nine metals, and cyanide. PAHs were evaluated by comparing total PAH concentrations with the toxicity

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[8] Hazard Quotients (HQs) are values obtained from dividing an estimated environmental exposure value by a toxicity reference value (such as a concentration known to cause no adverse effects. HQ values equal to or greater than 1.0 indicate potential ecological risk.

value for fluorine. However, the potential risks to soil invertebrates from the remaining contaminants for which no toxicity value was available are uncertain.

This risk assessment also indicates that, using mean contaminant concentrations, soil-invertebrate feeding birds are potentially at risk from aluminum, barium, cadmium, chromium, cobalt, copper, lead, mercury, selenium, silver, vanadium, zinc, and cyanide. Of these, chromium had the highest hazard quotients (HQs=67 and 6.7 using the No-Observed-Adverse-Effect Level [NOAEL] and Lowest-Observed-Adverse-Effect Level [LOAEL], respectively), while the remaining metals had lower quotients (HQs ranging from 1.3 to 26 using the NOAEL and 1.05 to 6.4 using the LOAEL). A summary of the derived HQs for soil invertebrate feeding birds is presented in Table 16.

The results of the ecological risk assessment also indicate that using mean contaminant concentrations, soil invertebrate-feeding mammals are potentially at risk from aluminum, arsenic, barium, cadmium, copper, lead, mercury, selenium, silver, thallium, vanadium, and cyanide. Of these, aluminum had the highest hazard quotients, with HQs of 259 and 26 using the NOAEL and LOAEL, respectively. The remaining contaminants had lower hazard quotients, ranging from 1.1 to 14 using the NOAELs and from 1.4 to 3.5 using the LOAELs. Toxicity values were not available for beryllium, iron, or thallium for birds, nor for iron for mammals. Therefore, the risks posed by these contaminants to these receptors are uncertain. A summary of the derived HQs for soil invertebrate feeding mammals is presented in Table 17.

Summary of Human Health and Ecological Risks

The human health risk assessment conducted for the Site concluded that the COCs detected in environmental media at the Site (*i.e.*, PAHs, arsenic, Aroclor 1248) at the levels identified in the RI pose elevated carcinogenic (under both current and future land-use scenarios) and noncarcinogenic (under the future land-use scenario) health risks to potentially exposed populations at the Site.

Based on the results of the ecological risk assessment, the contamination at the Site poses a risk to soil invertebrates and terrestrial vertebrates. Specifically, using maximum contaminant concentrations in surface soil, a risk was calculated for soil invertebrates from total PAHs, chromium, copper, lead, mercury, and zinc. Using mean contaminant concentrations, a risk was calculated for soil invertebrates from chromium, copper, mercury, and zinc.

This risk assessment also indicates that, using maximum contaminant concentrations, soil-invertebrate feeding birds are potentially at risk from aluminum, barium, cadmium, chromium, cobalt, copper, lead, mercury, selenium, silver, vanadium, zinc, and cyanide.

The results of the ecological risk assessment also indicate that, using maximum contaminant concentrations, soil invertebrate-feeding mammals are potentially at risk from aluminum, arsenic, barium, cadmium, copper, lead, mercury, selenium, silver, thallium, vanadium, and cyanide. Using mean contaminant concentrations, a risk was calculated from aluminum, arsenic, barium, cadmium, lead, mercury, selenium, silver, thallium, vanadium, and cyanide.

Although the risk assessment did not address exposures that occur as a result of the discharge of contaminated groundwater to Ley Creek, the groundwater underlying the Site has been documented to be a source of contamination to Ley Creek. Surface water samples in Ley Creek contained PCBs exceeding the NYSDEC's ambient water quality standards for New York State Class B surface waters and the levels of PCBs in Site groundwater, which discharges into Ley Creek, also exceeded the Class B surface water quality standards for PCBs. These standards are based on impacts to humans who consume fish and on wildlife protection. In addition, the levels of aluminum and iron exceeded the State's Class B ambient water quality standards for these metals in both Ley Creek surface water samples and in Site groundwater. The standard for aluminum is based on fish propagation, and the standards for iron are based on fish propagation and fish survival.

It should also be noted that Ley Creek surface water and sediments were not evaluated in the baseline human health and ecological risk assessments conducted for the Town of Salina Landfill subsite RI/FS due to the presence of upstream sources of contamination. Upstream contaminated surface water and sediments in Ley Creek are currently being investigated under an RI/FS for the General Motors Inland Fisher Guide (IFG) Facility and Ley Creek Deferred Media subsite of the Onondaga Lake site. It is anticipated that surface water and sediment contamination in Ley Creek adjacent to the landfill will be addressed in a subsequent investigation.

Based upon the human health and ecological risk assessments, and the fact that groundwater containing hazardous substances in excess of groundwater standards discharge unabated into Ley Creek, a tributary of Onondaga Lake, NYSDEC and EPA have determined that the Site poses an unacceptable threat which warrants remediation.

Basis for Action

Based upon the human health and ecological risk assessments, NYSDEC and EPA have determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances from the Site into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are site-specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs) and unacceptable exposures established in the risk assessment.

The following RAOs have been established for the Site:

- Reduce/eliminate contaminant leaching to ground water;
- Control surface water runoff and erosion;
- Prevent the off-Site migration of contaminated groundwater and leachate;
- Restore groundwater quality to levels which meet state and federal drinking-water standards;
- Prevent human contact with contaminated soils, sediment and ground water; and
- Minimize exposure of aquatic species and wildlife to contaminants in surface water, sediments, and soils.

SUMMARY OF ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. §9621(b)(1) and Title 6 of the Official Compilation of New York State Codes, Rules and Regulations (NYCRR) Part 375, mandates that a remedial action must be protective of human health and the environment, be cost-effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. CERCLA Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under applicable federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report and the FS Addendum. The FS report and related documents present numerous remedial alternatives. To facilitate the presentation and evaluation of the alternatives, the FS report and FS Addendum alternatives were reorganized in the revised Proposed Plan and this ROD to formulate the five remedial alternatives discussed below.

The present-worth costs for the alternatives discussed below are calculated using a discount rate of 7 percent and a 30-year time interval. The time to implement reflects only the time required to construct and implement the remedy and does not include the time required to design the remedy, insure the performance of the remedy by the Town of Salina, or procure contracts for design and construction.

The remedial alternatives are:

Alternative 1: No Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures.

Because this alternative would result in contaminants remaining on-Site, CERCLA requires that the Site undergo a statutory review at least once every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

Alternative 2: Part 360 Cap North and South of Ley Creek, Contaminated Groundwater/Leachate Collection North and South of Ley Creek, On-Site Groundwater/Leachate Treatment, Discharge of Treated Effluent to Ley Creek, and Long-Term Operation, Monitoring and Maintenance

Capital Cost:	$18,436,000
Annual OM&M Costs:	$ 408,700
Present-Worth Cost:	$23,507,000
Construction Time:	1.5 years

The key elements of this alternative are as follows:

- Construction of groundwater/leachate collection trenches north and south of Ley Creek;
- Excavation of contaminated sediments in the western drainage ditch;
- Lining the drainage ditches located along the northern and eastern borders of the Site;
- Consolidation of the excavated sediments and the soils and wastes (from the excavation of the collection trenches) on the landfill area north of Ley Creek, as appropriate;
- Construction of 6 NYCRR Part 360 caps over the landfill area north and south of Ley Creek;
- Engineered drainage controls and fencing;
- Installation of an on-Site, 150,000-gallon storage tank to hold excess water volume from the groundwater/leachate collection trenches stemming from storm events;
- Treatment of the collected contaminated groundwater/leachate at an on-Site treatment plant;

- Discharge of treated effluent to Ley Creek;

- Institutional controls;

- Operation and maintenance of the on-Site treatment plant and maintenance of the cap and groundwater/leachate collection trenches; and

- Long-term monitoring

The northern collection trench would be approximately 2,900 feet long. The southern collection trench would be approximately 1,260 feet long. The trenches would be constructed and the creek banks would be restored in compliance with the New York State stream protection ARAR, 6 NYCRR Part 608 Use and Protection of Waters. The groundwater/leachate collection trench would be installed along (the channelized portion of) Ley Creek. Based upon available data and the conclusion that the groundwater flow from the landfill south of Ley Creek is likely to be influenced by a northwestern flowing gradient to the southern collection trench along Ley Creek, a collection trench along the northern side of OLCC may not be needed. If monitoring data indicates a different flow gradient, then the need for a groundwater collection trench along the north side of the OLCC would be evaluated.

The institutional controls (such as deed restrictions) would prohibit the residential use of the Site property, the installation and use of groundwater wells, and excavation of soils that would negatively impact the integrity of the cap and groundwater/leachate collection trenches, and engineered drainage controls.

All excavated sediments, soils, and wastes which have PCB concentrations which equal or exceed 50 mg/kg would be sent off-Site for treatment/disposal at a Toxic Substances Control Act (TSCA)-compliant facility[9]. Those sediments that have PCB concentrations less than 50 mg/kg would be consolidated underneath the cover on the landfill area north of Ley Creek. Nonhazardous soils and waste would be consolidated on-Site over approximately 10 acres in a currently flat area in the northern portion of the Site. The consolidated material would be graded to improve drainage in this area and then covered with the Part 360 cap. It is anticipated that the high level of VOCs in the vicinity of MW-10 (see

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9 For cost estimating purposes, it was assumed that 25% of the materials in the waste area located to the south of Ley Creek would be hazardous.

Figure 2) would be excavated, since the well is within the expected area of the leachate collection trench north of Ley Creek.

After spreading the waste materials, soils, and sediments on top of the landfilled areas, the surfaces north and south of Ley Creek would be graded and covered. Before installing the multilayer caps north and south of Ley Creek, the subgrades would be graded to promote drainage and exhibit final slopes between 4% and 33%. After its installation, the caps would be seeded.

A 6 NYCRR Part 360 cap is commonly used in New York State to close municipal solid waste landfills. The cap systems would include the following components:

1. A 12-inch gas venting layer with a hydraulic conductivity equal or greater than $1x10^{-3}$ cm/sec directly overlying the waste material. A filter fabric is typically directly below and above the venting layer to minimize the migration of fines into the venting layer. This layer is required to transmit methane for high organic waste material;

2. A synthetic 60 mil geomembrane overlying the gas venting layer;

3. A 24-inch compacted soil layer to protect the geomembrane from root penetration, dessication, and freezing; and

4. A final 6-inches of topsoil placed on top of the protective layer to promote vegetative growth for erosion control.

Results of an analysis to determine the infiltration rate through the multilayer caps show a significant reduction in infiltration through the caps. Estimates of collection trench flow are made with consideration of the reduced infiltration, which results in a reduced saturated thickness and a reduced hydraulic gradient. The collection rate would likely decline over time as the local groundwater table lowers in response to the ongoing collection and discharge.

Prior to the installation of collection trenches, any landfill wastes encroaching on or near the banks of Ley Creek and OLCC would be pulled back 30 feet from the northern and southern banks of Ley Creek and 30 feet from the northern banks of OLCC. This waste would be removed and disposed properly at a permitted off-Site facility if it is characterized as hazardous waste. If it is not characterized as hazardous waste, then the waste would be consolidated onto the landfill. Site preparation prior to trench construction would include clearing, grubbing, and removal of trees along the relevant banks of Ley Creek. Erosion controls, including silt fencing and/or hay bales would be installed to prevent soil and silt runoff. The existing slopes along the banks would be regraded to provide a suitable work pad for construction of the trenches. Contaminated material cut from the banks would be placed under the cap (contingent upon the results of the PCB testing noted above).

The groundwater/leachate collection trenches would be keyed into the clay layer that acts as an aquitard between the shallow and deep aquifers at the Site. Where the clay layer is not present or is of insufficient thickness, the leachate collection trenches would be keyed into the dense glacial till. Additional investigation of the permeability of the glacial till would be conducted during the remedial design phase. If the glacial till is determined to not be a sufficiently low permeability material, then additional measures (*e.g.*, installation of sheet piling downgradient of the collection trenches) may be implemented to ensure that groundwater flow would not bypass the collection trenches.

Pending further evaluation, it is anticipated that the trenches would be installed using the bio-polymer slurry construction technique, which eliminates the need for shoring, dewatering, and personnel working in the trench. A barrier liner would be installed on the downgradient side of the trenches to prevent the inflow of uncontaminated water from Ley Creek. A perforated high density polyethylene (HDPE) pipe would be installed at the bottom of the trenches and a porous media (such as large diameter gravel) would be backfilled. The trenches would be designed such that collected water would flow by gravity through conveyance piping to existing manholes located on the northwestern and eastern parts of the Site. From these manholes, the water would be conveyed and treated at an on-Site treatment plant.

The on-Site treatment plant would consist of several treatment trains to address the various contaminants. The metals would likely be removed through the addition of chemical coagulants that promote a flocculation/sedimentation process. The metals and other solids, in a sludge form, would be sent to a thickener and filter press for dewatering. The solid materials would be transported to an approved off-Site disposal facility. The VOCs would likely be treated by an air stripper. Air strippers cause the volatilization of the contaminants out of the water into a collection unit or air stack, depending on the concentrations and whether it is acceptable under air permitting regulations. It is more likely that the air would be sent straight to an air stack. The water would be filtered through a sand filter and would likely be “polished” with activated carbon to remove any dissolved organic contamination that the other treatment processes do not address. After treatment, the effluent would be discharged to Ley Creek in conformance with State Pollution Discharge Elimination System (SPDES) program requirements.

After the installation of the trenches, the work areas in the buffer areas would be graded for proper drainage, covered with 0.5 foot of topsoil, and revegetated. The creek banks would be restored, as appropriate, in compliance with the New York State stream protection ARAR, 6 NYCRR Part 608 Use and Protection of Waters.

Calculations performed for this alternative estimated that approximately 45,600 gallons per day (gpd) would be discharged to the northern collection trench and 6,900 gpd would be discharged to the southern collection trench. These values would likely decline over time as the local groundwater table lowered in response to the collection and discharge.

The 48-inch abandoned sewer line that runs across the Site would be exposed, broken, and sealed with concrete (or some other suitable material) at the eastern and western borders of the Site, to prevent it from serving as a conduit to convey contaminated groundwater off-Site. In addition, a slip liner would be installed in the 48-inch CMP culvert located in the eastern part of the Site to prevent contaminated groundwater from leaking into the pipe and discharging to Ley Creek.

Sediments in the western drainage ditch would be excavated and the area restored, allowing for positive drainage of surface water runoff to Ley Creek. The drainage ditches located along the northern and eastern borders of the Site would be lined with a low permeability material[10]. The liner would be covered with either riprap or soil, depending on the expected surface water velocity. For costing purposes, it is estimated that 72,000 square feet of liner (3,600 linear feet by 20 feet wide) would be required. The actual amount of liner would be determined during the design phase. Grading and redirection of the drainage ditches would be conducted as necessary to facilitate installation of the liner.

Because the installation of the liner would likely cause the disturbance of wetland areas, mitigation of the affected wetlands is also included under this alternative.

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10 There are elevated levels of metals in the western drainage ditch which need to be addressed. Since these contaminated sediments are located in a valuable wetland area, they are being excavated under this alternative so that the wetland area can be restored. The northern and eastern drainage ditches, while located in wetland areas, these wetlands are not as valuable. Since they would likely not be restored, they can be lined. However mitigation for any loss of wetlands would be necessary.

As part of a long-term groundwater monitoring program, the direction of groundwater flow across the southeastern portion of the Site toward the northwest would be confirmed, biodegradation parameters (*e.g.*, oxygen, nitrate, sulfate, methane, ethane, ethene, alkalinity, redox potential, pH, temperature, conductivity, chloride, and total organic carbon) would be used to assess the progress of the degradation of the contaminants in the groundwater downgradient of the groundwater/leachate collection trenches (*i.e.*, the buffer areas between the trenches and the northern and southern banks of Ley Creek and between the limit of waste north of OLCC and the banks of OLCC.

Because this alternative would result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling would be utilized to assess the ability of natural attenuation[11] to attain MCLs in the 30-foot buffer areas (and downgradient of the groundwater/leachate collection trenches) and the buffer area north of the OLCC, and to otherwise confirm that the remedy remains protective. If justified by the review, additional remedial actions may be implemented.

Alternative 3: Waste Excavation South of Ley Creek and Consolidation North of Ley Creek, Part 360 Cap North of Ley Creek, Contaminated Groundwater/Leachate Collection North and Potentially South of Ley Creek, On-Site Contaminated Groundwater/Leachate Treatment, Discharge of Treated Effluent to Ley Creek, and Long-Term Operation, Monitoring and Maintenance

Capital Cost:	$20,448,000
Annual OM&M Costs:	$435,300
Present-Worth Cost:	$25,849,000
Construction Time:	2 years

This alternative is the same as Alternative 2, except that instead of capping the area between Ley Creek and OLCC, south of Ley Creek, the

11 Natural attenuation is a variety of physical, chemical and biological processes which, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil and groundwater. These in-situ processes include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction.

landfilled wastes would be excavated and relocated to the main landfilled area north of Ley Creek. A topsoil cover would be placed over the excavated area. This would be followed by a post-excavation assessment (to characterize groundwater and possibly other media, as appropriate, in the area where the removal had occurred).

Following the construction of a temporary bridge across Ley Creek and a haul road for the transport of excavated material to the northern part of the Site, the entire area south of Ley Creek (approximately four acres) would be cleared and grubbed to facilitate waste removal. Erosion controls would be established around the perimeter of the disturbed area. Once the area is prepared, an estimated 29,000 cubic yards of soil and waste would be excavated, transported to the northern portion of the Site, and staged. The excavation would remove apparent evidence of contamination, including visibly stained soils and soils with aromatic odors.

All excavated sediments, soils, and wastes which have PCB concentrations which equal or exceed 50 mg/kg would be sent off-Site for treatment/disposal at a TSCA-compliant facility[12]. Those sediments that have PCB concentrations less than 50 mg/kg would be consolidated underneath the cover on the landfill area north of Ley Creek. Nonhazardous soils and waste would be consolidated on-Site over approximately 10 acres in a currently flat area in the northern portion of the Site. The consolidated material would be graded to improve drainage in this area and then covered with the Part 360 cap. It is anticipated that the high level of VOCs in the vicinity of MW-10 (see Figure 2) would be excavated, since the well is within the expected area of the leachate collection trench north of Ley Creek.

The groundwater/leachate collection trench south of Ley Creek would not be immediately constructed. Following the excavation of the waste from the landfill area south of Ley Creek, groundwater monitoring and a study would be conducted to determine if (a) Site-related contaminants remaining in the area between Ley Creek and OLCC, if any, are a continuing potential source of contaminants to these tributaries (particularly PCBs and metals) at levels that require remediation, and (b) natural attenuation could reduce groundwater contaminants within and downgradient of the excavated source area to Maximum Contaminant

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12 For cost estimating purposes, it was assumed that 25% of the materials in the waste area located to the south of Ley Creek would be hazardous.

Levels (MCLs)[13] within an acceptable time frame. If the study indicates that Site-related contaminants are migrating or may potentially migrate off-Site at levels that would require remediation or that natural attenuation has little potential to adequately reduce on-Site groundwater contamination to MCLs, then a groundwater/leachate collection trench would be constructed south of Ley Creek.

Results of an analysis to determine the infiltration rate through the multilayer cap show a significant reduction in infiltration through the cap. Estimates of collection trench flow are made with consideration of the reduced infiltration, which results in a reduced saturated thickness and a reduced hydraulic gradient. The collection rate would likely decline over time as the local groundwater table lowers in response to the ongoing collection and discharge.

Because this alternative would result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling would be utilized to assess the ability of natural attenuation to attain MCLs in the area of the Site south of Ley Creek and in the 30-foot buffer areas (and downgradient of the groundwater/leachate collection trench(es)), and to otherwise confirm that the remedy remains protective. If justified by the review, additional remedial actions may be implemented.

Alternative 4: Part 360 Cap North and South of Ley Creek and Contaminated Groundwater/Leachate Collection North and South of Ley Creek, Pre-Treatment of the Collected Contaminated Groundwater/Leachate, Off-Site Contaminated Groundwater/Leachate Treatment and Discharge of Treated Effluent, and Long-Term Operation, Monitoring and Maintenance

Capital Cost:	$16,452,000
Annual OM&M Costs:	$277,000
Present-Worth Cost:	$19,888,400
Construction Time:	1.5 years

Alternative 4 is the same as Alternative 2, except that the collected contaminated groundwater/leachate would be pre-treated on-Site to meet

13 Drinking-water standards.

METRO's influent requirements. After pre-treatment, the effluent would be conveyed to METRO for final treatment and discharge to Onondaga Lake. The treated effluent would meet the substantive requirements of the SPDES program.

Because this alternative would result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling would be utilized to assess the ability of natural attenuation to attain MCLs in the two 30-foot buffer areas (and downgradient of the groundwater/leachate collection trenches) and the buffer area north of the OLCC, and to otherwise confirm that the remedy remains protective. If justified by the review, additional remedial actions may be implemented.

Alternative 5: Waste Excavation South of Ley Creek and Consolidation North of Ley Creek, Part 360 Cap North of Ley Creek, Contaminated Groundwater/Leachate Collection North and, Potentially, South of Ley Creek, Pre-Treatment of the Collected Groundwater/Leachate, Off-Site Contaminated Groundwater/Leachate Treatment and Discharge of Treated Effluent, and Long-Term Operation, Monitoring and Maintenance

Capital Cost:	$18,464,000
Annual OM&M Costs:	$303,500
Present-Worth Cost:	$22,230,400
Construction Time:	2 years

This alternative is the same as Alternative 3, except that the collected groundwater/leachate would be pre-treated on-Site to meet METRO's influent requirements. After pre-treatment, the effluent would be conveyed via the sanitary sewer system to METRO for final treatment and discharge to Onondaga Lake. The treated effluent would meet the substantive requirements of the SPDES program.

Because this alternative would result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling would be utilized to assess the ability of natural attenuation to attain MCLs in the area of the Site south of Ley Creek and in the 30-foot buffer areas (and downgradient of the groundwater/leachate collection trench(es)), and to otherwise confirm that the remedy remains protective. If justified by the review, additional remedial actions may be implemented.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, NYSDEC considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR §300.430(e)(9) and OSWER Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim Final*, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other applicable federal and state environmental statutes and requirements or provide grounds for invoking a waiver. Other applicable Federal or State advisories, criteria or guidance are To-Be-Considered (TBCs). TBCs are not required by the NCP, but may be very useful in determining what is protective at a Site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital and O&M costs, and net present-worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was discussed in the Proposed Plan:

8. *Support Agency acceptance* indicates whether, based on its review of the RI/FS reports and Proposed Plan, NYSDOH concurs with, opposes, or has no comments on the selected remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS reports and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, follows.

<u>Overall Protection of Human Health and the Environment</u>

Since Alternative 1 would not address the risks posed through each exposure pathway, it would not be protective of human health and the environment.

Alternatives 2, 3, 4, and 5 would be significantly more protective than Alternative 1, in that the risk of incidental contact with waste by humans and ecological receptors would be reduced by excavating the waste material, contaminated soils and sediments, and excavating and/or covering the landfilled waste material and contaminated soil. Collecting and treating the leachate and contaminated groundwater either on-Site or at METRO under Alternatives 2 and 4 would restore water quality in the aquifer downgradient of the collection trenches. Collecting and treating contaminated groundwater and leachate in a collection trench north and, possibly, south of Ley Creek, under Alternatives 3 and 5, in combination with removing landfilled wastes south of Ley Creek, would reduce groundwater contamination originating from this area and help restore water quality in the aquifer south of Ley Creek and downgradient of the northern collection trench.

Alternatives 2, 3, 4, and 5 would protect human health and the environment to a similar extent, since the excavation of the landfilled waste materials south of Ley Creek would involve removing known contaminant source material in this area, and the capping of landfilled waste in this area would significantly reduce infiltration of precipitation into the landfilled wastes, thereby reducing the volume of contaminants of concern that may migrate from the waste material to the groundwater. The use of collection trenches in all four of these alternatives would, in turn, direct the minimized flow of contaminated groundwater/leachate to appropriate treatment facilities. Alternatives 2 and 3 would achieve the treatment of contaminated groundwater/leachate by an on-Site treatment plant. Alternatives 4 and 5 would achieve the treatment of contaminated groundwater/leachate by an on-Site pre-treatment facility, followed by full treatment off-Site.

Compliance with ARARs

A 6 NYCRR landfill cap is an action-specific ARAR for landfill closure. Therefore, Alternatives 2, 3, 4, and 5 would satisfy this action-specific ARAR. Alternative 1 would not meet this ARAR, since it does not include any provisions for a 6 NYCRR Part 360 landfill cap.

Since Alternatives 2 and 4 would involve the excavation of PCB-contaminated sediments and Alternatives 3 and 5 would involve the excavation of PCB-contaminated waste material, soils, and sediments, their disposition would be governed by the requirements of TSCA. Those excavated waste materials, soils, and sediments which equal or exceed 50 mg/kg PCB would be sent off-Site for treatment/disposal at a TSCA-compliant facility. If off-Site disposal of contaminated waste material, soils, or sediments is necessary under Alternatives 2, 3, 4, and 5, state and federal regulations related to the transportation and off-Site treatment/disposal of wastes would apply. Since these alternatives would involve the excavation of contaminated soils and sediments, fugitive dust and VOC emission regulations would apply.

Alternatives 2, 3, 4, and 5 would comply with 6 NYCRR Part 608 by protecting Ley Creek and OLCC during construction and restoring the creek banks after construction is completed, as appropriate.

Alternative 1 does not provide for any direct remediation of groundwater and would, therefore, not comply with chemical-specific ARARs (*i.e.*, MCLs). A combination of the groundwater/leachate collection trenches and monitored natural attenuation (in the buffer areas downgradient of the trenches and north of OLCC, and in the area where landfilled wastes are removed south of Ley Creek in Alternatives 3 and 5) would result in the downgradient groundwater eventually meeting MCLs. However there is no expectation that MCLs would be met in the areas beneath the new landfill caps under Alternatives 2, 3, 4, and 5. The discharge to Ley Creek from the on-Site treatment facility under Alternatives 2 and 3 would need to meet State surface water discharge limits.

The groundwater/leachate collection trenches would prevent the migration of the contaminated groundwater away from the Site. Prevention of off-Site migration of contaminated groundwater and leachate is an action-specific ARAR for the Site.

The lower precipitation infiltration rate associated with placing an impermeable cap over the landfilled areas would significantly reduce the generation of leachate and additional groundwater contamination. The excavation of the waste materials south of Ley Creek under Alternatives 2, 3, 4 and 5 would significantly reduce the migration of contaminants to the groundwater in this area. Since the viability of monitored natural attenuation of the contaminated groundwater south of Ley Creek under Alternatives 3 and 5, and in the buffer areas in Alternatives 2 and 4 cannot be confirmed until after the landfilled waste material is removed, it is unknown whether removing the waste material in combination with natural attenuation of the groundwater in this area would adequately reduce off-Site migration of Site-related contaminants of concern or restore the on-Site groundwater exceeding MCLs to groundwater quality standards within an acceptable time frame.

EPA's 1985 Policy on Floodplains and Wetland Assessments for CERCLA Actions discusses situations that require preparation of a floodplains or wetlands assessment, and the factors that should be considered in preparing an assessment, for response actions taken pursuant to Section 104 or 106 of CERCLA. In addition, it requires that in cases where a proposed remedial action will take place within or affect wetlands or the 100-year and 500-year floodplains, a Statement of Findings be prepared to document this decision in the ROD. This statement must include: the reasons why the proposed action must be located in or affect the floodplain or wetlands; a description of significant facts considered in making the decision to locate in or affect the floodplain or wetlands including alternative sites and actions; a statement indicating whether the proposed action conforms to applicable state or local floodplain/wetland protection standards; a description of the steps taken to design or modify the proposed act to minimize the potential harm to or within the floodplain or wetlands; and a statement indicating how the proposed action affects the natural or beneficial values of the floodplains or wetlands. The Statement of Findings has been attached as Appendix V of this ROD.

Long-Term Effectiveness and Permanence

Alternative 1 would not provide reliable protection of human health and the environment over time. Alternatives 2, 3, 4, and 5 would be more effective over the long-term than Alternative 1, since they include the collection and treatment of the contaminated leachate and groundwater. Excavating the waste from the landfill area south of Ley Creek, excavating contaminated sediments from the western drainage ditch, consolidating the waste material, soils, and sediments on the landfill area north of Ley Creek and constructing an impermeable cap over the landfill area north of Ley Creek under Alternatives 3 and 5, and excavating contaminated sediments from the western drainage ditch, consolidating the sediments on the landfill area north of Ley Creek, and constructing caps over the landfill areas north and south of Ley Creek under Alternatives 2 and 4, would substantially reduce the residual risk posed by the landfilled waste on the Site by essentially isolating it from contact with human and environmental receptors. The impermeable caps constructed under Alternatives 2, 3, 4, and 5 would also reduce mobility of contaminants caused by infiltrating rainwater. The impermeable caps proposed in Alternatives 2, 3, 4, and 5 represent permanent measures that could be maintained at regular intervals to ensure their structural integrity. The long-term effectiveness of the remedial measures in the buffer areas would also be expected, as the contaminated soils would be removed. In addition, the removal of contaminated soils in the buffer areas would permanently eliminate the mobility of the contaminants.

The 6 NYCRR Part 360 cap(s) that would be constructed under Alternatives 2, 3, 4, and 5 would require routine inspection and maintenance to ensure their long-term effectiveness and permanence. Routine maintenance, as a reliable management control, would include mowing, fertilizing, reseeding, and repairing any potential erosion or burrowing rodent damage. The fencing under these alternatives would need to be inspected for holes or breeches. In addition, flushing of the collection trench drainage systems would need to be performed on a periodic basis, and engineered drainage controls would need to be inspected and repaired as needed. If it is determined that a groundwater/leachate collection system is not needed south of Ley Creek (*i.e.*, natural attenuation of the contaminated groundwater in this area would restore the groundwater exceeding MCLs to groundwater quality standards within an acceptable time frame), then Alternatives 3 and 5 would require less overall maintenance than Alternatives 2 and 4, since there would only be a single groundwater/leachate collection trench and a cap.

Reliability is another measure of the long-term effectiveness of a remedial action. A reliable alternative performs its function with reduced long-term oversight and maintenance. Long-term operation and maintenance would be required for all of the action alternatives.

Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative 1 would not actively reduce the toxicity, mobility, or volume of contaminants through treatment. This alternative would solely rely on natural attenuation to reduce the levels of contaminants.

The impermeable landfill caps in Alternatives 2, 3, 4, and 5 would result in significantly reduced infiltration of precipitation into the landfill, and therefore a significant reduction in the mobility of the contaminants, and a significantly reduced volume of contaminated groundwater/leachate requiring treatment.

Treating the collected leachate and contaminated groundwater, at either an on-Site or off-Site treatment plant, under Alternatives 2, 3, 4, and 5 would reduce the toxicity, mobility, and volume of contaminants in collected leachate/groundwater through treatment, and it would also reduce the possibility of additional groundwater contamination.

To the extent that Alternatives 2, 3, 4, and 5 would limit further migration of and potential exposure to hazardous substances, by nearly eliminating the infiltration of rainwater into the waste disposal areas and the associated leaching of contaminants from these areas , the reduction in mobility would not be accomplished through treatment.

Short-Term Effectiveness

Alternative 1 does not include any physical construction measures in any areas of contamination and, therefore, does not present a risk to the community as a result of their implementation. The excavation of 4 - 5 acres of waste under Alternatives 3 and 5 may result in the release of objectionable odors. The excavation and relocation of this waste would also pose a much more significant risk of exposure of on-Site workers to potentially contaminated soils and waste material than any of the other alternatives. Long-term monitoring activities related to Alternatives 2, 3, 4, and 5 would present some risk to on-Site workers through dermal contact and inhalation. Alternatives 2, 3, 4, and 5 would pose an additional risk of exposure of on-Site workers to waste material and contaminated sediments and soils through excavating, moving, placing, and regrading the waste and contaminated soils and sediments. Alternatives 2, 3, 4, and 5 would also pose a risk of exposure of on-Site workers to potentially contaminated soils and groundwater through the installation of groundwater/leachate collection trenches. The noted exposures to on-Site workers under Alternatives 2 through 5 can be minimized by utilizing proper protective equipment. The vehicle traffic associated with landfill cap construction and the off-Site transport of contaminated soils/sediments could impact the local roadway system and nearby residents through increased noise level. Disturbance of the land during excavation and cap and groundwater/leachate collection trench construction could affect the surface water hydrology of the Site. There would also be the potential for increased stormwater runoff and erosion during excavation and construction activities that must be properly managed to prevent excessive water and sediment loading.

Excavation and impermeable cap construction activities, as well as groundwater/leachate collection trench installation activities as part of Alternatives 2, 3, 4, and 5, would require substantial clearing of trees and vegetation across the Site, which would temporarily disrupt animal habitats during the construction. Alternatives 3 and 5 would likely be most disruptive to habitats, since they would likely take longer to implement and would be more invasive than Alternatives 2 and 4. Excavation of the waste under Alternatives 3 and 5, as well as the construction of the collection trenches could result in fugitive dust generation, and direct contact with waste and contaminated soil or water. Engineering controls could be applied to reduce the production of dust, and health and safety measures can reduce direct contact with contamination.

Since no activities would be performed under Alternative 1, there would be no implementation time. It is estimated that Alternatives 3 and 5 would be implemented in approximately 2 years. Alternatives 2 and 4 would be implemented in approximately 1.5 years.

Implementability

Alternative 1 involves no construction and would, therefore, be easy to implement. Excavating contaminated sediments from the western drainage ditch, consolidating the sediments on the landfill area north of Ley Creek, constructing mulit-layer caps over the landfill areas north and south of Ley Creek, and installing groundwater/leachate collection trenches north and south of Ley Creek under Alternatives 2 and 4, and excavating the waste from the landfill area south of Ley Creek, excavating contaminated sediments from the western drainage ditch, consolidating the waste material, soils, and sediments on the landfill area north of Ley Creek, constructing an impermeable cap over the landfill areas north of Ley Creek, and installing a groundwater/leachate collection trench north and, if needed, south of Ley Creek under Alternatives 3 and 5, although more difficult to implement than Alternative 1, can be accomplished using technologies known to be reliable and can be readily implemented. Since they involve the movement of a substantial amount of waste material, Alternatives 3 and 5 would be more difficult to implement than Alternatives 2 and 4. Alternatives 2, 3, 4, and 5 would also involve monitoring of natural attenuation parameters. Equipment, services and materials for this work are readily available. These actions would also be administratively feasible.

With regard to the groundwater components of the action alternatives, the construction of the on-Site treatment plant (Alternatives 2 and 3) would be more difficult to implement than the on-Site pre-treatment plant (Alternatives 4 and 5), as there would be more construction necessary.

The on-Site and off-Site treatment facilities would be a reliable source of treatment of the collected groundwater/leachate.

Alternatives 4 and 5, which include off-Site treatment, would need to obtain permission to send the collected groundwater/leachate to the disposal/treatment facility.

Since Alternatives 2, 3, 4, and 5 may result in the disturbance of wetland areas, mitigation of the affected wetlands is also included under these alternatives. If wetland mitigation would include the establishment of a new on-Site high quality wetland, this may be more feasible to implement under Alternatives 3 and 5 since the area south of Ley Creek may be available for wetland development.

Cost

The estimated capital, annual OM&M, and present-worth costs for each of the alternatives are presented below. The present-worth costs are calculated using a discount rate of 7 percent and a 30-year time interval[14].

[14] For cost estimating purposes, it was assumed that 25% of the materials in the waste area located to the south of Ley Creek would be hazardous, and would, therefore, require off-Site treatment/disposal at a TSCA-compliant facility.

Alternative No.	Capital	Annual O&M	Present Worth
1	$ 0	$ 0	$ 0
2	$18,436,000	$408,700	$23,507,000
3	$20,448,000	$435,300	$25,849,000
4	$16,452,000	$277,000	$19,888,400
5	$18,464,000	$303,500	$22,230,400

As is indicated from the cost estimates, there are no costs associated with the no action alternative, Alternative 1. The estimated present-worth costs for Alternatives 3 and 5 are $2,342,000 greater than those for Alternatives 2 and 4, respectively (reflecting the greater cost of excavating vs. capping the landfill south of Ley Creek). The estimated present-worth costs for Alternatives 2 and 3 are $3,618,600 greater than those for Alternatives 4 and 5 (reflecting the greater cost for full-scale on-Site treatment versus on-Site pretreatment followed by off-Site treatment at METRO.

<u>Support Agency Acceptance</u>

EPA has determined that the remedy selected by NYSDEC, the lead agency for this Site, meets the requirements for remedial action set forth in CERCLA Section 121, 42 U.S.C. §9621. EPA has adopted this remedy's selection by cosigning this ROD. NYSDOH concurs with the selected remedy; its letter of concurrence is attached (see Appendix IV).

<u>Community Acceptance</u>

Comments received during the public comment period are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, NYSDEC and EPA have determined that Alternative 2 best satisfies the requirements of CERCLA Section 121, 42 U.S.C. Section 9621 and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 CFR Section 300.430(e)(9).

Under the requirements of the NCP, the “Overall Protection of Human Health and the Environment” and “Compliance with ARARs” evaluation criteria are threshold requirements that each alternative must meet in order to be eligible for selection. Each of the Alternatives 2, 3, 4, and 5 would reduce the risk of incidental contact with waste by humans and ecological receptors. As discussed above, Alternatives 4 and 5 are the same as Alternatives 2 and 3, respectively, except that on-Site treatment and discharge of leachate/groundwater for Alternatives 2 and 3 would be replaced by on-Site pretreatment and off-Site treatment and discharge at METRO for Alternatives 4 and 5. While Alternatives 2 and 3 would both effectively prevent the risk of incidental contact with waste material, contaminated soils, and contaminated sediment by humans and ecological receptors, Alternative 2, the selected remedy, has the following advantages over Alternative 3:

- Alternative 2 could be implemented more quickly (it is estimated that Alternative 2 would be implemented in 1.5 years while Alternative 3 would take an estimated two years to implement) and at a lower cost than Alternative 3 (the estimated present-worth cost for Alternative 2 is $2,342,000 less than that for Alternative 3, which presents a significant cost savings to the Town of Salina and State of New York);

- For cost-estimating purposes, it was assumed that 25% of the waste in the waste area to be excavated south of Ley Creek would be hazardous. If the volume of hazardous waste increases, so would the excavation and disposal-related capital costs for Alternative 3;

- Alternative 3 has greater potential than Alternative 2 to generate short-term impacts, such as objectionable odors during excavation; and

- The presumptive remedy for landfills (of the size of the waste area south of Ley Creek is 4 - 5 acres) is capping.

As is described in the above evaluation of alternatives, NYSDEC and EPA believe that the selected remedy for the Site will provide the best balance of tradeoffs among alternatives with respect to the evaluation criteria, would be protective of human health and the environment, and would comply with all ARARs. The selected remedy would mitigate the migration of contamination to Onondaga Lake via Ley Creek; it would provide a reduction in the toxicity, mobility, and/or volume of contaminated groundwater and leachate through treatment; it would satisfy the ARARs and RAOs; and it would provide long-term effectiveness. The selected alternative would be implemented in a reasonable time frame with minimal significant short-term impacts to human health or the environment. The selected remedy would be cost-effective, and would utilize permanent solutions to the maximum extent practicable. The selected remedy would also meet the statutory preference for the use of treatment (of the contaminated groundwater and leachate) as a principal element. Finally, the selected remedy would provide overall protection to human health and the environment.

Description of the Selected Remedy

The selected remedy involves:

- Excavation of contaminated sediments in the western drainage ditch;
- Construction of groundwater/leachate collection trenches north and south of Ley Creek;
- Consolidation of the excavated sediments and the soils and wastes (from the excavation of the collection trenches) on the landfill areas;
- Construction of 6 NYCRR Part 360 caps over the landfill areas north and south of Ley Creek;
- Lining the drainage ditches located along the northern and eastern borders of the Site;
- Engineered drainage controls and fencing;
- Installation of an on-Site 150,000-gallon storage tank to hold excess water volume stemming from storm events;
- Treatment of the collected contaminated groundwater/leachate at an on-Site treatment plant;
- Discharge of treated effluent to Ley Creek;
- Institutional controls (such as restrictive covenants and/or environmental easements) to prohibit residential use of Site property and the installation and use of groundwater wells, as well as to protect and ensure the integrity of the caps,

groundwater/leachate collection trenches, and engineered drainage controls;

- Maintenance of the caps and groundwater/leachate collection trenches; and

- Long-term monitoring.

The selected alternative is presented in Figure 8.

The Town of Salina will need to certify the continued effectiveness of the institutional and engineering controls on a yearly basis in an annual report. The certification will need to indicate that the required long-term monitoring is being conducted, identify the required institutional and engineering controls, indicate whether they remain effective for the protection of public health and the environment, and indicate whether they should remain in place.

All excavated sediments and any excavated soils or wastes which have PCB concentrations which equal or exceed 50 mg/kg will be sent off-Site for treatment/disposal at a TSCA-compliant facility. Those sediments and any excavated soils or wastes that have PCB concentrations less than 50 mg/kg will be consolidated underneath the cap on the landfill areas.

Before installing the multilayer caps, the subgrade will be graded to promote drainage and exhibit final slopes between 4% and 33%. The entire cap will then be seeded.

Currently, the limits of the landfill waste encroach on the banks of Ley Creek in several locations. Landfilled waste will be pulled back 30 feet from the northern and southern banks of Ley Creek and 30 feet from the northern banks of OLCC prior to the installation of the groundwater/leachate collection trenches[15]. This landfilled waste will be removed and disposed properly at a permitted off-Site facility if it is characterized as hazardous waste. If it is not characterized as hazardous waste, then the waste will be consolidated onto the landfill. The groundwater/leachate collection trenches will then be installed along the northern and southern banks of Ley Creek at the new limits of the waste. Based upon available data and the conclusion that the groundwater flow from the landfill south of Ley Creek is likely to be influenced by a

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15 The northern and southern collection trenches will be approximately 2,900 feet long and 1,260 feet long, respectively.

northwestern flowing gradient to the southern collection trench along Ley Creek, a collection trench along the northern side of OLCC may not be needed. If monitoring data indicates a different flow gradient, then the need for a groundwater collection trench along the north side of the OLCC will be evaluated. Site preparation prior to trench construction will include clearing, grubbing, and removal of trees along the northern and southern banks of Ley Creek. Erosion controls, including silt fencing and/or hay bales will be installed to prevent soil and silt runoff from entering the creek. The existing slopes along the banks will be regraded to provide a suitable work pad for construction of the trench. Contaminated material cut from the banks will be placed under the cap (contingent upon the results of the PCB testing noted above).

The groundwater/leachate collection trenches will be keyed into the clay layer that act as an aquitard between the shallow and deep aquifers at the Site. Where the clay layer is not present or is of insufficient thickness, the leachate collection trenches will be keyed into the dense glacial till. Additional investigation of the permeability of the glacial till will be conducted during the remedial design phase. If the glacial till is determined to not be a sufficiently low permeability material, then additional measures (*e.g.*, installation of sheet piling downgradient of the collection trenches) may be implemented to ensure that groundwater flow will not bypass the collection trenches.

Pending further evaluation during design, it is anticipated that the trenches will be installed using the bio-polymer slurry construction technique, which eliminates the need for shoring, dewatering, and personnel working in the trench. A barrier liner will be installed on the downgradient side of the trenches to prevent the inflow of uncontaminated water from Ley Creek. A perforated HDPE pipe will be installed at the bottom of the trenches and a porous media (such as large diameter gravel) will be backfilled. The trenches will be designed such that collected water will flow by gravity through conveyance piping to existing manholes located on the northwestern and eastern parts of the Site. From these manholes, the water will be treated at an on-Site treatment plant.

After the installation of the trenches, the downgradient work areas will be graded for proper drainage and covered with 0.5 foot of topsoil. All areas disturbed by the construction will be revegetated. The trenches will be constructed and buffer areas and the banks of Ley Creek and OLCC will be restored, as appropriate, in compliance with the New York State stream protection ARAR, 6 NYCRR Part 608 Use and Protection of Waters.

The 48-inch abandoned sewer line that runs across the Site will be exposed, broken, and sealed with concrete (or some other suitable material) at the eastern and western borders of the Site, to prevent it from serving as a conduit to convey contaminated groundwater off-Site. In addition, a slip liner will be installed in the 48-inch CMP culvert located in the eastern part of the Site to prevent contaminated groundwater from leaking into the pipe and discharging to Ley Creek.

Sediments in the western drainage ditch will be excavated and the area restored, allowing for positive drainage of surface water runoff to Ley Creek. The drainage ditches located along the northern and eastern borders of the Site will be lined with a low permeability material. The liner will be covered with either rip rap or soil, depending on the expected surface water velocity. It is estimated that 72,000 square feet of liner (3,600 linear feet by 20 feet wide) will be required. Grading and redirection of the drainage ditches will be conducted as necessary to facilitate installation of the liner. Additionally, surface water will be temporarily rerouted if necessary during the construction. Because the installation of the liner will likely cause the disturbance of wetland areas, mitigation of the affected wetlands is also included under the selected alternative.

During the preliminary remedial design, delineation and evaluation of any wetlands on or adjacent to the Site or impacted by the Site consistent with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989); 40 CFR Part 6, Appendix A: "Statement of Procedures on Floodplain Management and Wetlands Protection," Executive Order 11990: "Protection of Wetlands," and EPA's 1985 "Statement of "Policy on Floodplains/Wetlands Assessments for CERCLA Actions" will be performed. Also, since remedial activities will take place within the 100- or 500-year floodplain, a floodplain assessment consistent with Executive Order 11988: "Floodplain Management", and 40 CFR Part 6, Appendix A will be performed to minimize or avoid the adverse effects of a 500-year event, as well as to protect against the spread of contaminants and the long-term disabling of remedial treatment systems due to flooding events. In addition, the substantive requirements of Title 6 of the Official Compilation of New York State Codes, Rules and Regulations (NYCRR) Part 502, Floodplain Management Criteria for State Projects will also need to be met.

A soil gas survey, in addition to what has already been performed at the landfill, to determine the potential for soil vapor intrusion into nearby structures will be performed if determined to be necessary by New York State Department of Health.

The selected remedy will be designed to the extent practicable so as not to inhibit or impair National Grid's operations on the Site. Coordination with National Grid to identify the location of all of its utility lines, structures and facilities will be done in order to identify design requirements for uninterrupted access by National Grid and to ensure safe construction of the selected remedy.

If the ongoing negotiations between the Town of Salina and Onondaga County related to the utilization of METRO to treat the collected contaminated groundwater/leachate are successful before the Remedial Design Work Plan is approved for the Site, then the collected leachate and groundwater will be pre-treated on-Site and conveyed to METRO in lieu of undergoing complete treatment at an on-Site treatment facility and discharged to Ley Creek (*i.e.*, Alternative 4 would be implemented).

Because the selected remedy will result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. As part of any such review, groundwater monitoring results and Site modeling will be utilized to assess the ability of natural attenuation to attain MCLs in the two 30-foot buffer areas associated with Ley Creek and in the buffer area north of OLCC, and to otherwise confirm that the remedy remains protective. If justified by the review, additional remedial actions may be implemented.

Summary of the Estimated Remedy Costs

The estimated capital cost for the selected remedy is $18.4 million. The estimated annual cost associated with maintenance of the landfill cap, and treatment of the collected leachate, in addition to other operation and maintenance items, is $408,700 for 30 years. The estimated total present-worth cost of the selected remedy is $23.5 million. The total present worth is the sum of capital cost and the present-worth cost of O&M, which is based on a project life of 30 years and a 7% discount rate.

These engineering cost estimates are expected to be within +50 to -30 percent of the actual project cost, and are based upon the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedy.

In addition to the preceding information, see Table 18 entitled "Cost Estimate Input Data for Selected Remedy."

Expected Outcomes of the Selected Remedy

Based upon the human health and ecological risk assessments, NYSDEC and EPA have determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected alternative or one of the other active measures considered, present a current or potential threat to public health or the environment.

Specifically, it has been concluded that: (1) trespassers and wildlife could come into contact with contamination at the current landfill surface; (2) trespassers and wildlife could come into contact with the leachate seeps along the bank of Ley Creek; (3) wildlife could be exposed to contaminated sediment in the western drainage swale of the landfill; and (4) there is a potential risk to anyone that would use the groundwater as a drinking source.

The selected alternative will cap the landfill waste mass, contain and treat contaminated groundwater, and prevent exposure to humans and the environment. The selected remedy will preclude the migration of contamination to the Onondaga Lake system from the Site; it will provide a reduction in the toxicity, mobility, or volume of Site-related contaminants; it will satisfy the ARARs and RAOs (with the exception of groundwater ARARs on the Site); and it will provide long-term effectiveness. The selected remedy will be cost-effective, and will utilize permanent solutions to the extent practicable.

The selected remedy will also meet the statutory preference for the use of treatment as a principal element. Finally, the selected remedy will provide overall protection of human health and the environment due to contaminants that are present at the Site. With regard to groundwater, it will take approximately one and a half years to construct the groundwater collection and treatment system. Since the groundwater portion of the remedy is hydraulic containment using collection trenches, groundwater cleanup standards will not be achieved. The property and surrounding areas are presently zoned industrial, and the reasonably anticipated future land use is not expected to change. It is also anticipated that the future use of the Site groundwater will not be a drinking water source.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a Site.

For the reasons discussed below, NYSDEC and EPA have determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment through capping of the Salina Landfill waste mass and leachate seeps, thereby eliminating the threat of exposure *via* direct contact with or ingestion of the contaminated media. The selected remedy will reduce exposure levels by reducing the amount of water contaminated by the landfill waste by not allowing precipitation to infiltrate into the landfill. The remedy will also prevent or substantially eliminate the migration of contamination to the Onondaga Lake system from the Site through capping and the installation of the leachate collection trenches. Short-term human health or ecological risks posed by the landfill and leachate seeps can be minimized with deed restrictions, maintenance of the temporary covers, and fencing, while the landfill is being capped. The selected remedy will also provide overall protection by reducing the toxicity, mobility, and volume of contamination through the capping of the landfill and treatment of the collected leachate.

Compliance with ARARs and Other Environmental Criteria

A summary of the ARARs and "Other Criteria, Advisories, or Guidance TBCs" which will be complied with during implementation of the selected remedy, is presented below.

- Clean Air Act (CAA) National Emissions Standards for Hazardous Air Pollutants, 40 CFR Parts 61 and 63

- Resource Conservation and Recovery Act (RCRA), Standards for Hazardous Waste Generators; Manifesting; Pre-Transportation; Reporting Requirements, 40 CFR Part 262 Subparts B, C, D

- RCRA Subtitle C - Hazardous Waste Management, Identification and Listing of Hazardous Wastes, 40 CFR Part 261

- Standards for Hazardous Waste Generators, Hazardous Waste Determinations, 40 CFR Part 262.11

- Standards for Hazardous Waste Generators, 90-Day Accumulation Rule, 40 CFR Part 262.34

- Standards for Owners/Operators of Hazardous Waste Treatment, Storage and Disposal (TSD) Facilities, Parts 264 and 265, Subparts B, F, G, J, S, and X

- RCRA, Standards of Capping: Surface Impoundments, Waste Piles, Landfills, Subtitle C, 40 CFR Parts 264 and 265, Subparts K, L and N

- RCRA Subtitle C, Land Disposal Restrictions (LDRs), 40 CFR Part 268

- RCRA Subtitle D, Criteria for Classification of Waste Disposal Facilities, 40 CFR Part 257

- U.S. Department of Transportation Rules for Hazardous Materials Transport, 49 CFR Part 107 et. seq.

- Occupational Health and Safety Act, Worker Health and Safety, 29 CFR 1910.120 and 29 CFR 1926

- NYSDEC Identification and Listing of Hazardous Wastes, 6 NYCRR Part 371

- New York State Hazardous Waste Management Facility Regulations, 6 NYCRR Parts 370, 372 and 373

- NYSDEC Corrective Action for Solid Waste Management Units, 6 NYCRR Part 373-2.19

- New York State Solid Waste Management Facility Regulations, 6 NYCRR Parts 360 and 364

- NYSDEC LDRs, 6 NYCRR Part 376

- New York State Classifications of Surface Waters and Groundwaters, 6 NYCRR Part 701

- New York State Regulations on the State Pollution Discharge Elimination System (SPDES), 6 NYCRR Parts 750-758

- New York State Air Pollution Control Regulations, 6 NYCRR Parts 120, 200-203, 207, 211, 212 and 219
- New York State Air Quality Standards, 6 NYCRR Part 257
- Local County or Municipality Pretreatment Requirements, Local regulations
- Safe Drinking Water Act (SDWA) MCLs and MCLGs (40 CFR Part 141)
- New York State Surface Water and Groundwater Quality Standards and Groundwater Effluent Standards, 6 NYCRR Part 703
- Clean Water Act (CWA), Wastewater Discharge Permits, Effluent Guidelines, Best Available Technology (BAT) and BMPPT, 40 CFR Parts 122, 125 and 401
- Floodplain Management 40 CFR 6, Subpart A, 40 CFR 6.302
- 40 CFR Part 6, Appendix A, Statement of Procedures on Floodplain Management and Wetlands Protection
- Fish and Wildlife Coordination Act, 16 U.S.C. 661, Modification to Waterways that Affects Fish of Wildlife, 40 CFR 6.302 (122.49)
- National Historic Preservation Act, 16 U.S.C. 470
- New York State Freshwater Wetlands Law ECL, Article 24, 71 in Title 23
- New York State Freshwater Wetlands Implementation Program, 6 NYCRR 662 and 665
- New York State Protection of Waters Program, 6 NYCRR Part 608
- CWA Section 401, State Water Quality Certification (WQC) Program, 33 U.S.C. 1341
- 40 CFR Parts 230 and 231 (associated with the Clean Water Act, Section 404)
- Freshwater Wetlands Regulations, Guidelines on Compensatory Mitigation, October 1993 (A New York State SCG)

- Requirements for Management of Hazardous Contaminated Media (Hazardous Waste Identification Rule (HWIR) - Media), 61 FR 18879, 40 CFR Part 260, et. al.

- CAA, National Ambient Air Quality Standards, 40 CFR Part 50

- Executive Order 11990 (Protection of Wetlands)

- Executive Order 11988 (Floodplain Management)

- Land Use in the CERCLA Remedy Selection Process, OSWER Directive No. 9355.7-04

- EPA Statement of Policy on Floodplains and Wetlands Assessments for CERCLA Actions

- New York Guidelines for Soil Erosion and Sediment Control

- New York State Air Cleanup Criteria, January 1990

- SDWA Proposed MCLs

- NYSDEC, Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, October 1998

- New York State Groundwater Effluent Limitations, TOGS 1.1.2

- NYSDEC Division of Water, Guidance on Groundwater Contamination Strategy, TOGS 2.1.1

- New York State Ambient Air Quality Guidelines, Air Guide-1

- NYSDEC Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites, October 1994

- EPA Ambient Water Quality Criteria (Federal Register, Volume 57, No. 246, December 22, 1992)

- NYSDEC Remedial Program Soil Cleanup Objectives, 6 NYCRR Part 375-6

- New York State Environmental Conservation Law Section 27-1318, Institutional and Engineering Controls

- New York State Codes, Rules and Regulations (NYCRR) Part 502, Floodplain Management Criteria for State Projects

Cost-Effectiveness

For the foregoing reasons, it has been determined that the selected remedy provides for overall effectiveness in proportion to its cost.

The estimated capital costs for the selected remedy is $18.4 million. The estimated annual O&M cost for 30 years is $408,700 per year. The estimated total present-worth cost of the selected remedy is approximately $23.5 million.

Although Alternative 1 (No Action) is less costly than the selected remedy, it will not achieve the overall protection of human health and the environment, and contamination from the Site will continue to migrate into the Onondaga Lake System.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanence and treatment can be practicably utilized at this Site.

The selected remedy will not provide a permanent solution for the Town of Salina Landfill in that the entire landfill will not be treated. Even if the waste mass were completely removed from the landfill site, the waste would be deposited elsewhere. This removal and off-Site disposal would not reduce the volume of waste. Therefore, even though the landfill waste is not reduced by the selected remedy, it is contained to prevent exposure to humans and the environment.

The leachate collection trenches will collect the contaminated groundwater and leachate from the landfill, eliminating the mobility of the waste. The leachate will be treated, thereby reducing the toxicity of the waste.

There are no principal threat wastes located at the Site. However, any hazardous waste that is found at the Site (for example, during the installation of the leachate collection trenches) will be removed and handled in an appropriate manner (disposal at an approved hazardous waste treatment, storage, or disposal Site).

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that the leachate and contaminated groundwater will be collected and treated, and will no longer reach the tributary of Onondaga Lake, Ley Creek. Any hazardous wastes encountered during the construction of the leachate collection trenches will be treated off-Site at an approved treatment, storage and disposal facility.

Five-Year Review Requirements

Since the selected alternative will result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site undergo a statutory review every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes to the remedy, as originally identified in the revised Proposed Plan, were necessary or appropriate.

APPENDIX I

Figures

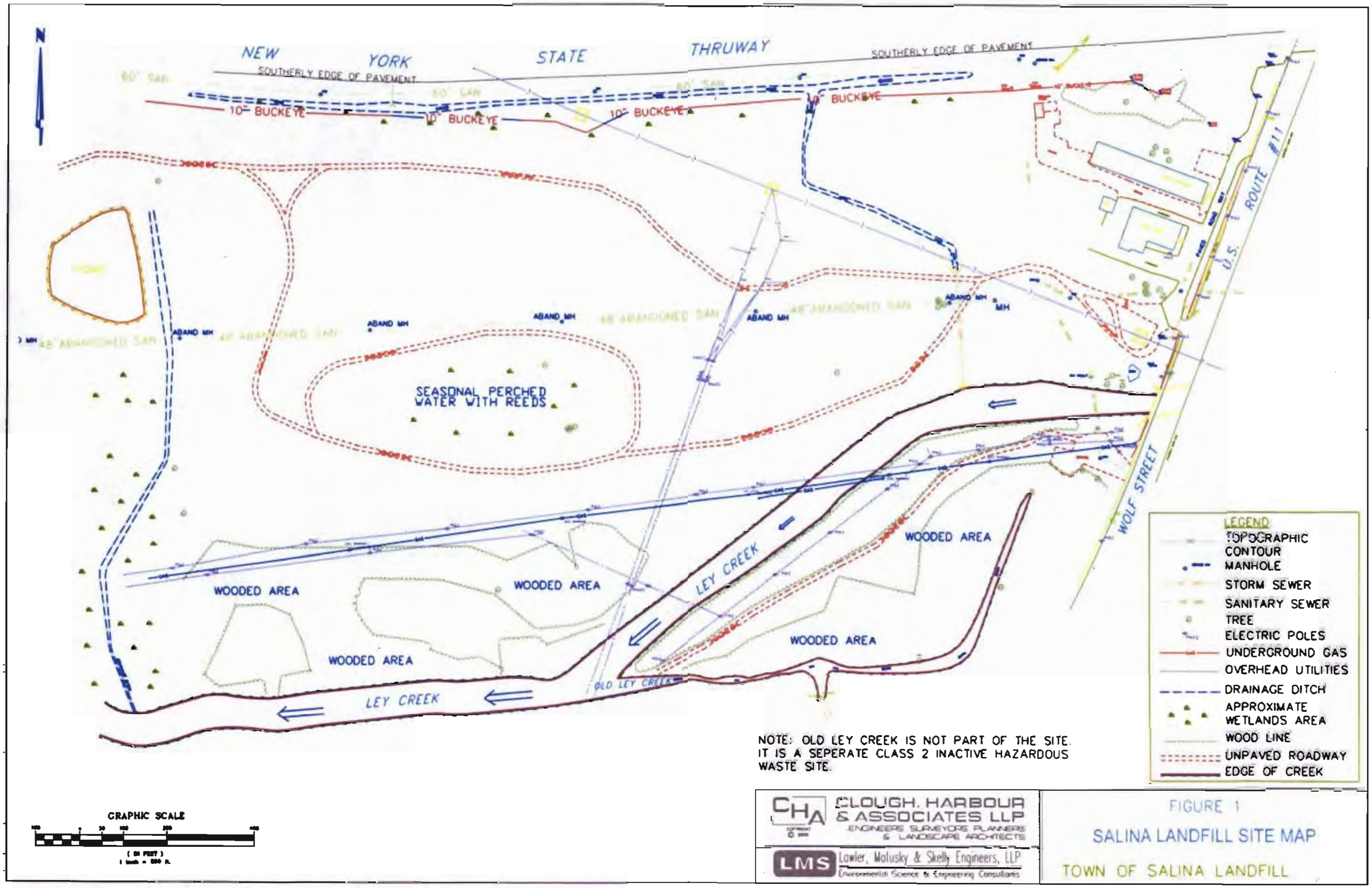

FIGURE 1

SALINA LANDFILL SITE MAP

TOWN OF SALINA LANDFILL

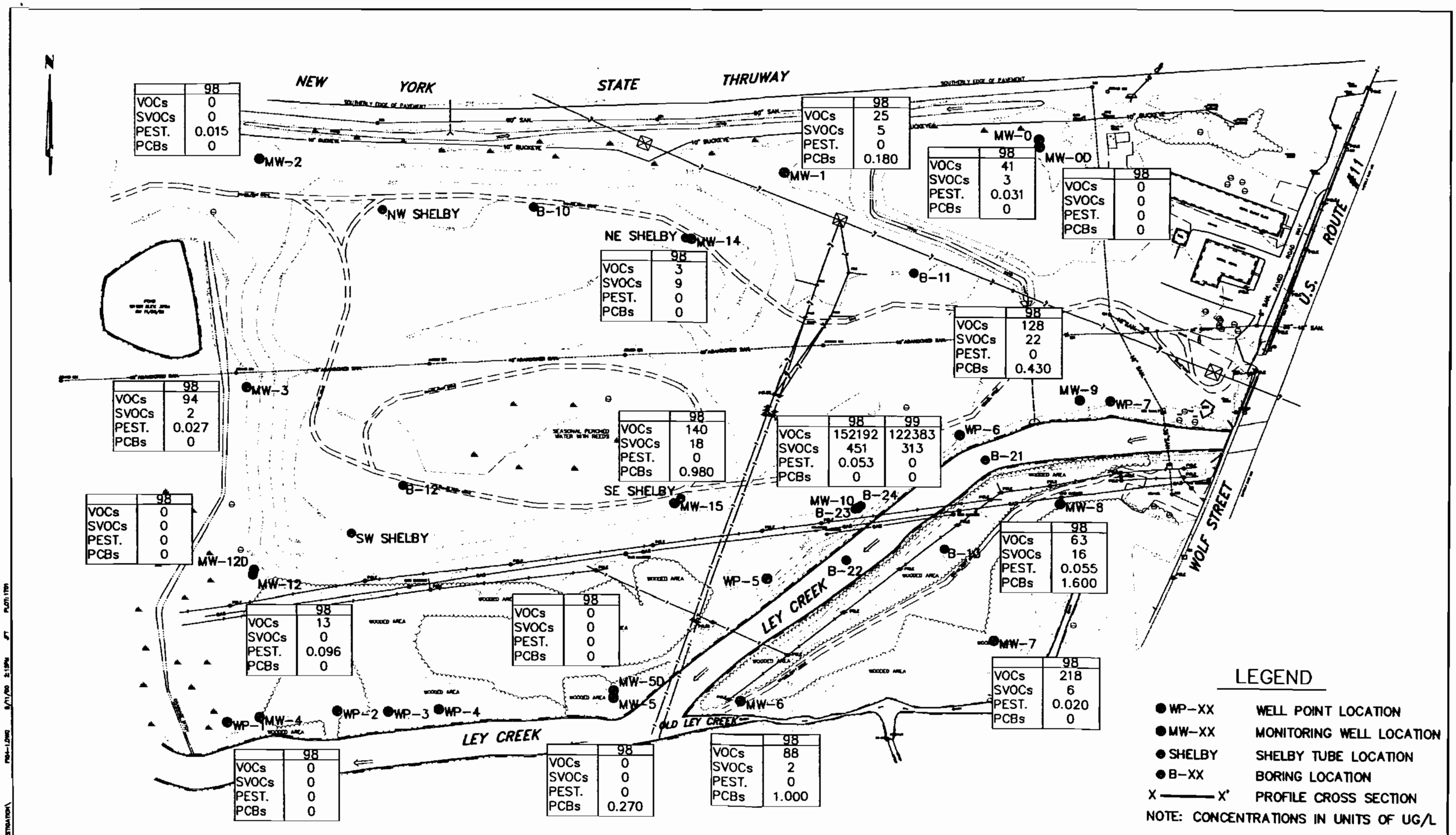

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FIGURE 2
SUMMARY OF GROUNDWATER DATA
TOWN OF SALINA LANDFILL

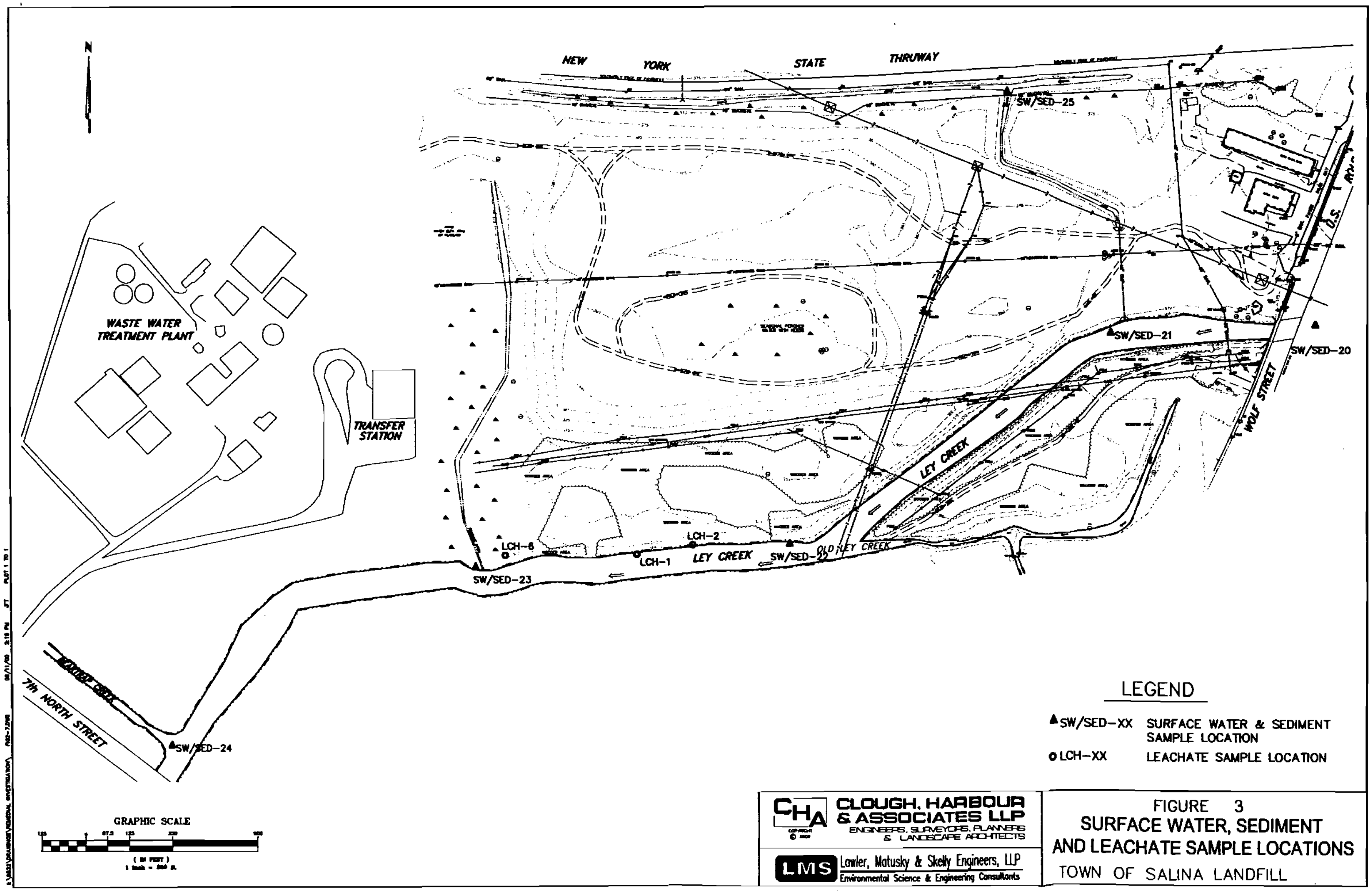
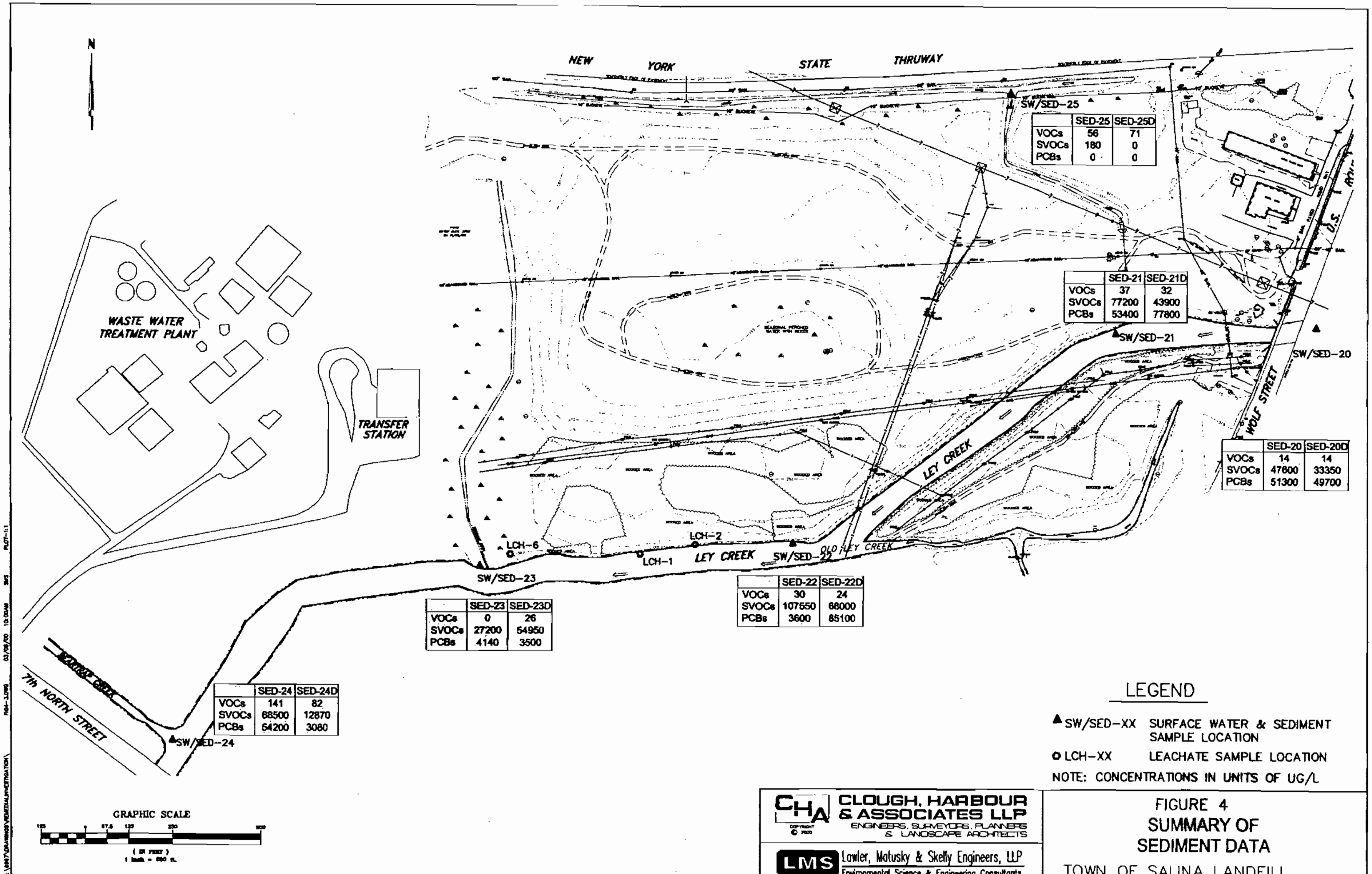


FIGURE 3
SURFACE WATER, SEDIMENT AND LEACHATE SAMPLE LOCATIONS
TOWN OF SALINA LANDFILL



	SED-25	SED-25D
VOCs	56	71
SVOCs	180	0
PCBs	0	0

	SED-21	SED-21D
VOCs	37	32
SVOCs	77200	43900
PCBs	53400	77800

	SED-20	SED-20D
VOCs	14	14
SVOCs	47600	33350
PCBs	51300	49700

	SED-22	SED-22D
VOCs	30	24
SVOCs	107550	68000
PCBs	3600	85100

	SED-23	SED-23D
VOCs	0	26
SVOCs	27200	54950
PCBs	4140	3500

	SED-24	SED-24D
VOCs	141	82
SVOCs	68500	12870
PCBs	54200	3080

LEGEND

▲ SW/SED-XX SURFACE WATER & SEDIMENT SAMPLE LOCATION

○ LCH-XX LEACHATE SAMPLE LOCATION

NOTE: CONCENTRATIONS IN UNITS OF UG/L

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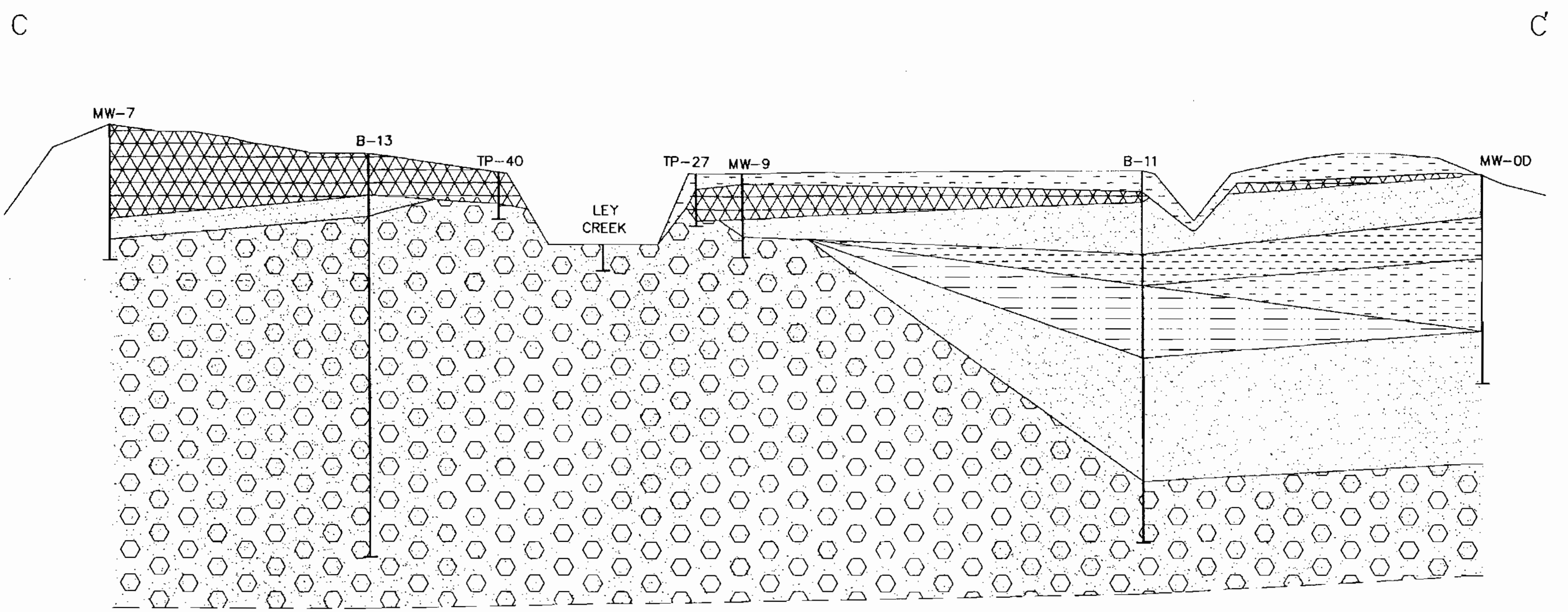
FIGURE 4
SUMMARY OF SEDIMENT DATA
TOWN OF SALINA LANDFILL



SCALE

HORIZONTAL: 1"=80'

VERTICAL: 1"=20'

LEGEND

SAND	SILT AND CLAY	SAND AND SILT
CLAY	DEBRIS/WASTE	TILL

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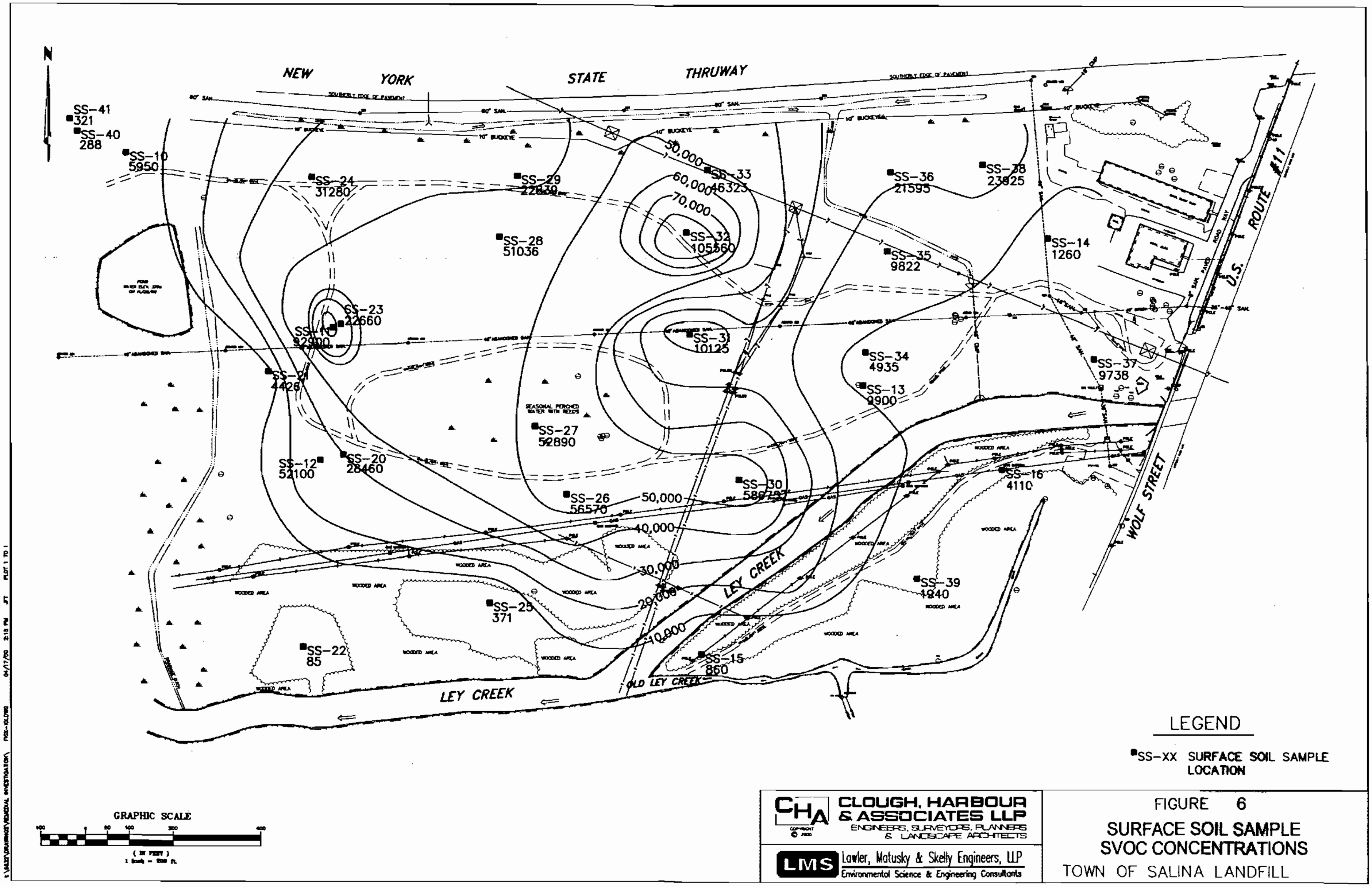
FIGURE 5
GEOLOGIC CROSS-SECTION C-C'
TOWN OF SALINA LANDFILL



LEGEND

■SS-XX SURFACE SOIL SAMPLE LOCATION

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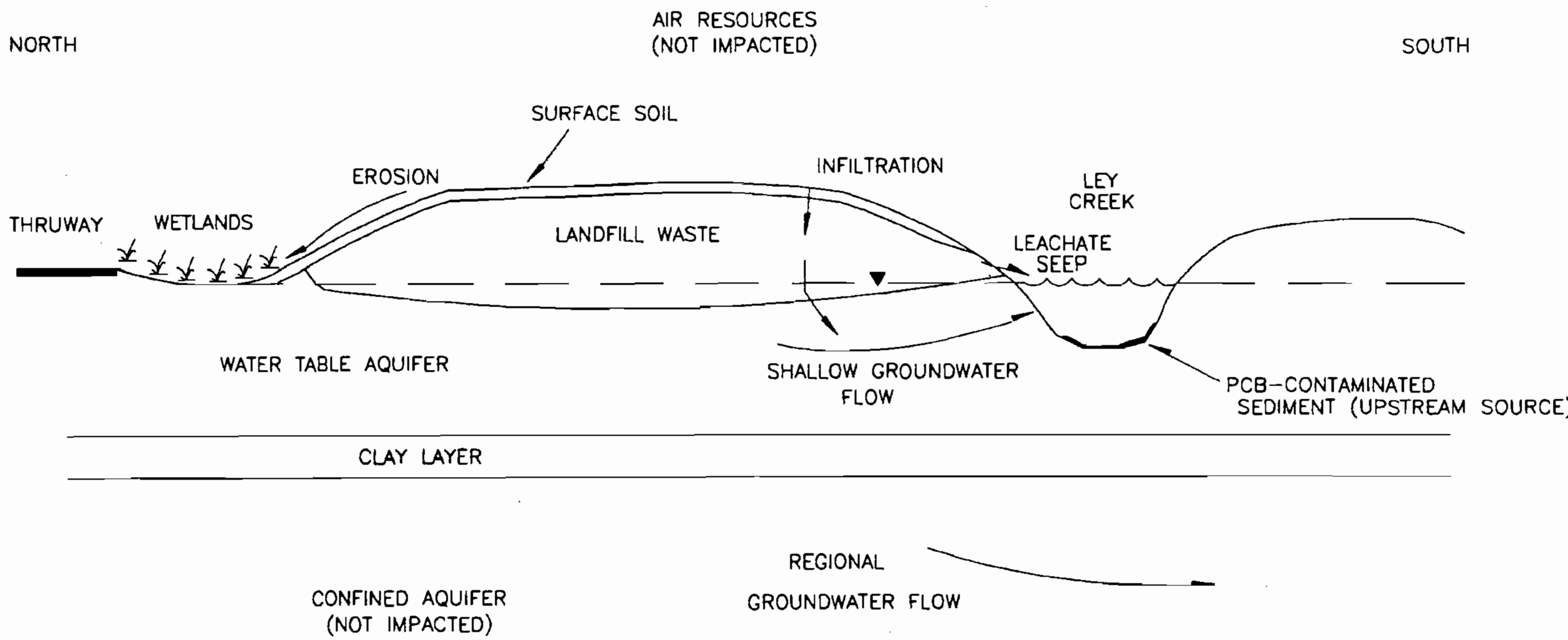
FIGURE 6

SURFACE SOIL SAMPLE SVOC CONCENTRATIONS

TOWN OF SALINA LANDFILL



LEGEND

WATER TABLE

CONTAMINANT MIGRATION PATHWAYS

NOT TO SCALE

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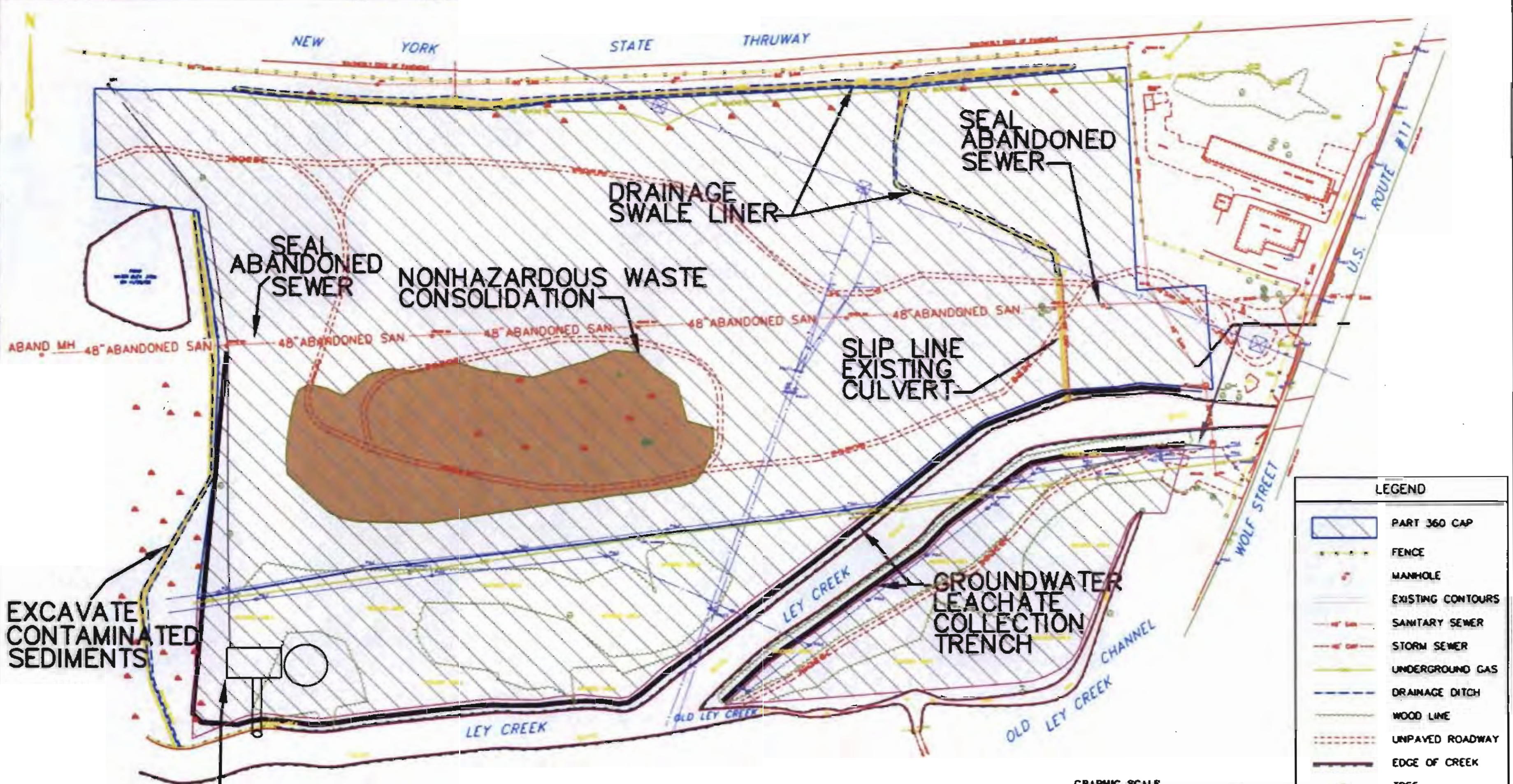
FIGURE 7
CONCEPTUAL CONTAMINANT MIGRATION PATHWAYS
TOWN OF SALINA LANDFILL



ON-SITE STORAGE TANK, TREATMENT PLANT & DISCHARGE

NOTES:

1. OLD LEY CREEK IS NOT PART OF THE SITE. IT IS A SEPARATE CLASS 2 INACTIVE HAZARDOUS WASTE SITE.
2. LOCATIONS OF REMEDIAL COMPONENTS ARE APPROXIMATE AND SUBJECT TO CHANGE DURING REMEDIAL DESIGN.
3. ALTERNATIVE 2 – PART 360 CAP NORTH AND SOUTH OF LEY CREEK, GROUNDWATER COLLECTION NORTH AND SOUTH OF LEY CREEK.
4. NON-HAZARDOUS WASTE CONSOLIDATION FROM EXCAVATION OF LEACHATE COLLECTION TRENCHES

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FIGURE 8

ALTERNATIVE 2

TOWN OF SALINA LANDFILL

APPENDIX II

Tables

Table 1
Nature and Extent of Contamination

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (mg/kg)	FREQUENCY OF EXCEEDING CLEANUP OBJECTIVE	CLEANUP OBJECTIVE (mg/kg) *
Surface Soils	Semivolatile Organic Compounds	Benzo(a)anthracene	ND to 88.0	21 of 27	0.224
		Benzo(a)pyrene	ND to 87.0	23 of 27	0.061
		Benzo(b)fluoranthene	ND to 13.9	14 of 27	1.1
		Benzo(k)fluoranthene	ND to 3.7	8 of 27	1.1
		Indeno(1,2,3-cd)pyrene	ND to 5.0	4 of 27	3.2
		Dibenzo(a,h)anthracene	ND to 0.95	19 of 27	0.014
		Chrysene	ND to 9.1	20 of 27	0.4
Surface Soils	Inorganics	Arsenic	ND to 7.0	8 of 27	1.1
		Barium	ND to 530	17 of 27	61.85
		Beryllium	ND to 0.48	7 of 27	0.16
		Cadmium	ND to 17.3	11 of 27	1.0
		Chromium	ND to 127	27 of 27	10
		Cobalt	ND to 17	6 of 27	8.55
		Copper	ND to 103	12 of 27	18.45
		Iron	4,800 to 18,800	27 of 27	20000
		Lead	ND to 1,163	13 of 27	28.6
		Manganese	273 to 557	1 of 27	492.0
		Mercury	ND to 1.5	18 of 27	0.100
		Nickel	11 to 70	26 of 27	37.3
		Selenium	ND to 23	20 of 27	2.0
		Silver	ND to 8	12 of 27	1.1
		Thallium	ND to 3.6	10 of 27	1.1
		Vanadium	ND to 22	2 of 27	21.15
		Zinc	39 to 1,733	27 of 27	20.0

* - NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (mg/kg)	FREQUENCY OF EXCEEDING CLEANUP OBJECTIVE	CLEANUP OBJECTIVE (mg/kg) *
Subsurface Soils	Volatile Organic Compounds	1,1-Dichloroetane	ND to 377	1 of 8	200
		1,2-Dichloroethene (total)	ND to 766	1 of 8	300
		2-Butanone	ND to 420	2 of 8	300
		Acetone	ND to 1,600	3 of 8	200
		Ethylbenzene	ND to 9,700	1 of 8	5,500
		Toluene	ND to 147,949	1 of 8	1,500
		Xylene (Total)	ND to 45,362	1 of 8	1,200
Suburface Soils	Semivolatile Organic Compounds	Benzo(a)anthracene	ND to 16.0	6 of 8	0.224
		Benzo(a)pyrene	ND to 11.7	7 of 8	0.061
		Benzo(b)fluoranthene	ND to 22.2	6 of 8	1.1
		Benzo(k)fluoranthene	ND to 8.6	1 of 8	1.1
		Indeno(1,2,3-cd)pyrene	ND to 5.2	1 of 8	3.2
		Dibenzo(a,h)anthracene	ND to 1.5	1 of 8	0.014
		Chrysene	ND to 15.4	7 of 8	0.4
		Phenol	ND to 0.5	1 of 8	0.030
Subsurface Soils	Polychlorinated Biphenyls **	Aroclor-1248	0.087 to 420	8 of 8	10.0*
Sediment	Inorganics	Arsenic	5.3 to 6.7	1 of 2	6.0
		Cadmium	5.3 to 6.7	2 of 2	0.6
		Copper	13 to 28	1 of 2	16.0
		Mercury	ND to 0.15	1 of 2	0.15

* - NYSDEC TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels

** - Values listed reflect the combined guidance for "Total PCBs" - Approximate Background

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ug/l)	FREQUENCY OF EXCEEDING CLEANUP OBJECTIVE	CLEANUP OBJECTIVE (ug/l) *
Groundwater	Volatile Organic Compounds	1,1,1-Trichloroethane	ND to 2,822	3 of 19	5.0
		1,2-Dichloroethene	ND to 26,742	5 of 19	5.0
		Acetone	ND to 3,100	1 of 19	5.0
		Benzene	ND to 29	4 of 19	1.0
		Chlorobenzene	ND to 23	2 of 19	5.0
		Chloroethane	ND to 136	4 of 19	5.0
		Toluene	ND to 92,774	4 of 19	5.0
		Vinyl Chloride	ND to 1,059	3 of 19	2.0
		Xylenes (Total)	ND to 17,900	4 of 19	5.0
Groundwater	Semi-Volatile Organic Compounds	1,4-Dichlorobenzene	ND to 10	4 of 19	3.0
		Naphthalene	ND to 36	2 of 19	10.0
Groundwater	PCBs	Aroclor 1248	ND to 1.6	6 of 19	0.09
Groundwater	Inorganics	Arsenic	ND to 73.6	2 of 19	25
		Barium	ND to 1,687	1 of 19	1,000
		Cadmium	ND to 34.0	12 of 19	5
		Iron	701 to 56,000	19 of 19	300
		Lead	ND to 52.2	2 of 19	25
		Manganese	33.4 to 7,633	14 of 19	300
Leachate	Volatile Organic Compounds	Benzene	ND to 4	1 of 3	1**
		Chlorobenzene	ND to 22	2 of 3	5**
Leachate	Pesticides/ PCBs	Aroclor 1248	0.7 to 1.0	3 of 3	0.09**
Leachate	Inorganics	Aluminum	1,051 to 12,131	2 of 3	2,000**
		Barium	460 to 1,501	1 of 3	1,000**
		Chromium	42 to 125	2 of 3	50**
		Iron	31,183 to 156,000	3 of 3	300**
		Lead	29 to 198	3 of 3	25**
		Manganese	412 to 1,000	3 of 3	300**

* - TOGS 1.1.1 Standards or Guidance Values for Class B Surface Waters

** - No Promulgated Standards for Leachate, TOGS 1.1.1 Standards or Guidance Values Used

TABLE 2
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
(Page 1 of 2)

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value (4)	Screening Toxicity Value (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
75-25-2	Bromoform	10	J	12	J	ug/kg	SS-15, -16	7/7	NA	12	N/A	720000 C	81000	EPA SSLs	NO	BSL
75-09-2	Methylene Chloride	1	J	1	J	ug/kg	SS-10, -14	2/7	11 - 12	1	N/A	760000 C	85000	EPA SSLs	NO	BSL
106-46-7	1,4-Dichlorobenzene	46	J	47	J	ug/kg	SS-33	2/27	330 -3700	47	N/A	240000 C	27000	EPA SSLs	NO	BSL
91-57-6	2-Methylnaphthalene	46	J	540		ug/kg	SS-27	11/27	330 -3700	540	N/A	41000000 N	36400	NYS TAGM	NO	BSL
106-47-8	4-Chloroaniline	75	J	210	J	ug/kg	SS-20	5/27	330 -3700	210	N/A	8200000 N	3500000	Reg IX PRG	NO	BSL
83-32-9	Acenaphthene	61	J	1000		ug/kg	SS-32	16/27	330 -3700	1000	N/A	120000000 N	4700000	EPA SSLs	NO	BSL
208-96-8	Acenaphthylene	43	J	1800	J	ug/kg	SS-11	17/27	330 - 1900	1800	N/A	N/A	41000	NYS TAGM	NO	NTX, BSL
120-12-7	Anthracene	50	J	2500	J	ug/kg	SS-11	22/27	330 - 1900	2500	N/A	610000000 N	23000000	EPA SSLs	NO	BSL
56-55-3	Benzo(a)anthracene	40	J	8800	D	ug/kg	SS-32	25/27	330 - 350	8800	N/A	78000 C	900	EPA SSLs	YES	FD, ASL
50-32-8	Benzo(a)pyrene	40	J	8700	D	ug/kg	SS-32	25/27	330 - 9500	8700	N/A	780 C	90	EPA SSLs	YES	FD, ASL
205-99-2	Benzo(b)fluoranthene	60	J	13900		ug/kg	SS-11	24/27	330 - 1900	13900	N/A	7800 C	900	EPA SSLs	YES	FD, ASL
191-24-2	Benzo(g,h,i)perylene	40	J	5200	D	ug/kg	SS-32	24/27	330 - 390	5200	N/A	N/A	50000	NYS TAGM	NO	NTX, BSL
207-08-9	Benzo(k)fluoranthene	70	J	3700	J	ug/kg	SS-11	25/27	330 - 370	3700	N/A	78000 C	9000	EPA SSLs	NO	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	40	J	1360		ug/kg	SS-16	5/27	330 - 1900	1360	N/A	410000 C	46000	EPA SSLs	NO	BSL
86-74-8	Carbazole	47	J	700		ug/kg	SS-11, -32	17/27	330 - 1900	700	N/A	290000 C	32000	EPA SSLs	NO	BSL
218-01-9	Chrysene	50	J	9100	D	ug/kg	SS-32	26/27	330 - 350	9100	N/A	780000 C	88000	EPA SSLs	NO	BSL
53-70-3	Dibenz(a,h)anthracene	99	J	960		ug/kg	SS-28	17/27	330 - 1900	960	N/A	780 C	90	EPA SSLs	YES	ASL
132-64-9	Dibenzofuran	47	J	3700	J	ug/kg	SS-11	51.85	330 - 3700	3700	N/A	8200000 N	5100000	Reg IX PRG	NO	BSL
206-44-0	Fluoranthene	41	J	18000		ug/kg	SS-11	27/27	NA	18000	N/A	82000000 N	3100000	EPA SSLs	NO	BSL
86-73-7	Fluorene	36	J	1100	J	ug/kg	SS-11	18/27	330 - 1900	1100	N/A	82000000 N	3100000	EPA SSLs	NO	BSL
118-74-1	Hexachlorobenzene	110	J	130	J	ug/kg	SS-20	2/27	330 - 3700	130	N/A	3600 C	400	EPA SSLs	NO	BSL, IFD
193-39-5	Indeno(1,2,3-cd)pyrene	70	J	5000	D	ug/kg	SS-32	23/27	330 - 1900	5000	N/A	7800 C	900	EPA SSLs	YES	FD, ASL
91-20-3	Naphthalene	50	J	670		ug/kg	SS-32	13/27	330 - 3700	670	N/A	41000000 N	3100000	EPA SSLs	NO	BSL
85-01-8	Phenanthrene	50	J	14000	D	ug/kg	SS-32	26/27	330 - 350	14000	N/A	N/A	50000	NYS TAGM	NO	NTX, BSL
129-00-0	Pyrene	44	J	16000	D	ug/kg	SS-32	27/27	NA	16000	N/A	61000000 N	2300000	EPA SSLs	NO	BSL
72-54-8	4,4' - DDD	6.9		27		ug/kg	SS-11	3/27	3.4 - 37	27	N/A	24000 C	3000	EPA SSLs	NO	BSL
72-55-9	4,4'- DDE	1.7	JP	15		ug/kg	SS-13	3/27	3.4 - 350	15	N/A	17000 C	2000	EPA SSLs	NO	BSL
50-29-3	4,4'-DDT	0.61	JP	20	P	ug/kg	SS-12	4/27	3.4 - 350	20	N/A	17000 C	2000	EPA SSLs	NO	BSL
309-00-2	Aldrin	1.4	J	1.8	JP	ug/kg	SS-11	2/27	1.8 - 180	1.8	N/A	340 C	40	EPA SSLs	NO	BSL, IFD
12789-03-6	alpha-Chlordane	4.4	JP	6.9	JP	ug/kg	SS-11	2/27	1.8 - 180	6.9	N/A	16000 C	500	EPA SSLs	NO	BSL, IFD

(1) Minimum/maximum detected concentration.
(2) Total of 7 surface soil samples analyzed for VOCs; 27 samples analyzed for SVOCs and Pest/PCBs; 29 samples analyzed for meta
(3) Maximum concentration used for screening.
(4) Off-Site samples SS-40 and SS-41 used as background samples - Refer to text for supporting information.
Maximum analyte concentration found in two samples used as screening tool.
(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used.
(Cancer benchmark value = 1E-06; HQ=0.1)
(6) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient or common earth mineral(NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
EPA SSLs= EPA Generic Soil Screening Levels.
Reg IX PRG = EPA Region IX Preliminary Remediation Goals.
NYS TAGM = New York State Technical Administrative Guidance Manual (soil guidance values).
East U.S. = Eastern U.S. background range.
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 2
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: On-Site

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	(4) Background Value	(5) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(6) Rationale for Contaminant Deletion or Selection
319-85-7	BHC (beta isomer)	2.1	P	2.7	JP	ug/kg	SS-11	3/27	1.8 - 180	2.7	N/A	3200 C	400	EPA SSLs	NO	BSL
319-86-8	BHC (delta isomer)	0.31	JP	0.9	J	ug/kg	SS-11	2/27	1.8 - 180	0.9	N/A	N/A	300	NYS TAGM	NO	NTX, BSL, IFD
58-89-9	BHC (gamma isomer) (Linda	0.66	JP	0.71	JP	ug/kg	SS-11	2/27	1.8 - 180	0.71	N/A	4400 C	500	EPA SSLs	NO	BSL, IFD
60-57-1	Dieldrin	0.45	JP	6.8	JP	ug/kg	SS-11	4/27	3.5 -350	6.8	N/A	360 C	40	EPA SSLs	NO	BSL
7421-36-3	Endrin Aldehyde	0.62	JP	14	JP	ug/kg	SS-11	3/27	3.4 - 350	14	N/A	N/A	NA	NA	NO	NTX
53494-70-5	Endrin Ketone	3.5	JP	35	P	ug/kg	SS-11	3/27	3.4 - 350	35	N/A	N/A	NA	NA	NO	NTX
5103-74-2	gamma-Chlordane	0.72	J	7.9	P	ug/kg	SS-11	3/27	1.8 - 180	7.9	N/A	N/A	540	NYS TAGM	NO	NTX, BSL
72-43-5	Methoxychlor	2.7	JP	17	JP	ug/kg	SS-11	3/27	17.9 - 1800	17	N/A	10000000 N	390000	EPA SSLs	NO	BSL
1267-229-6	Aroclor-1248	220		8400	J	ug/kg	SS-16	2/27	34 - 3500	8400	N/A	2900 C	1000	EPA SSLs	YES	ASL
742-99-05	Aluminum	5160		13000		mg/kg	SS-39	29/29	NA	13000	11100	2000000 N	100000	Reg IX PRG	NO	BSL, BKG,NUT
7440-38-2	Arsenic	2.6		7		mg/kg	SS-11	9/29	2.1 - 2.2	7	BDL	3.8 C	0.4	EPA SSLs	YES	ASL
7440-39-3	Barium	32.1		530		mg/kg	SS-26	29/29	NA	530	64	140000 N	5500	EPA SSLs	NO	NUT, BSL
7440-41-7	Beryllium	0.36	B	0.48	B	mg/kg	SS-11	7/29	0.62 - 0.66	0.48	BDL	4100 N	1.75	East U.S.	NO	BSL,NUT
7440-43-9	Cadmium	1.1		17.3		mg/kg	SS-11	29/29	NA	17.3	1.4	2000 N	78	EPA SSLs	NO	BSL
7440-70-2	Calcium	6860	G	119000		mg/kg	SS-11	29/29	NA	119000	12800	N/A	12800 (SB)	NYS TAGM	NO	NUT
7440-47-3	Chromium	10.7		127.1	J	mg/kg	SS-16	29/29	NA	127.1	20	N/A	390	EPA SSLs	NO	BSL
7440-48-4	Cobalt	4.8	B	16.5		mg/kg	SS-15	29/29	NA	16.5	9	120000 N	100000	Reg IX PRG	NO	BKG, BSL
7440-50-8	Copper	18.3		859.6		mg/kg	SS-16	29/29	NA	859.6	23	82000 N	76000	Reg IX PRG	NO	BSL
7439-89-6	Iron	4800		19800		mg/kg	SS-28	29/29	NA	19800	16400	610000 N	100000	Reg IX PRG	NO	BKG, NUT, BSL
7439-92-1	Lead	8.7		1163.2		mg/kg	SS-15	29/29	NA	1163.2	20	N/A	400	EPA SSLs	YES	ASL,TX
7439-95-4	Magnesium	1746		27000		mg/kg	SS-22	29/29	NA	27000	7410	N/A	7410 (SB)	NYS TAGM	NO	NUT, NTX
7439-96-5	Manganese	273		4447	J	mg/kg	SS-15	29/29	NA	4447	509	290000 N	32000	Reg IX PRG	NO	BKG, BSL
7439-97-6	Mercury	0.22		2.6		mg/kg	SS-11	18/29	0.1 - 0.11	2.6	BDL	N/A	23	EPA SSLs	NO	BSL
7440-02-0	Nickel	10.9		82.3		mg/kg	SS-16	29/29	NA	82.3	16	41000 N	1600	EPA SSLs	NO	BSL
7440-09-7	Potassium	557	B	2872	J	mg/kg	SS-15	29/29	NA	2872	982	N/A	982 (SB)	NYS TAGM	NO	NUT
7782-49-2	Selenium	4.6	N	22.8	N	mg/kg	SS-22	22/29	1.0 - 1.2	22.8	9	10000 N	390	EPA SSLs	NO	BSL
7440-22-4	Silver	0.35		8		mg/kg	SS-21, -21, -28	14/29	0.33 - 2.2	8	BDL	10000 N	390	EPA SSLs	NO	BSL
7440-23-5	Sodium	663	B	875	B	mg/kg	SS-15	7/29	208 - 221	875	BDL	N/A	SB	NYS TAGM	NO	NUT
7440-28-0	Thallium	2.4	N	3.6	N	mg/kg	SS-29, -32	10/29	1.2 - 2.2	3.6	BDL	140 N	130	Reg IX PRG	NO	BSL
7440-62-2	Vanadium	11.9		22.4		mg/kg	SS-28	27/29	6.3 - 6.5	22.4	22	14000 N	550	EPA SSLs	NO	BKG, BSL
7440-66-6	Zinc	39.4	E	1732.6		mg/kg	SS-16	29/29	NA	1732.6	62	610000 N	23000	EPA SSLs	NO	BSL

(1) Minimum/maximum detected concentration.

(2) Total of 7 surface soil samples analyzed for VOCs; 27 samples analyzed for SVOCs and Pest/PCBs; 29 samples analyzed for met

(3) Maximum concentration used for screening.

(4) Off-Site samples SS-40 and SS-41 used as background samples - Refer to text for supporting information.
Maximum analyte concentration found in two samples used as screening tool.

(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used.
(Cancer benchmark value = 1E-06; HQ=0.1)

(6) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient or common earth mineral(NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
EPA SSLs= EPA Generic Soil Screening Levels.
Reg IX PRG = EPA Region IX Preliminary Remediation Goals.
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East U.S. = Eastern U.S. background range.
J = Estimated Value
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TABLE 3
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: On-Site

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	(4) Background Value	(5) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(6) Rationale for Contaminant Deletion or Selection
71-55-6	1,1,1-Trichloroethane	58.62	J	58.62	J	ug/kg	TP-34	1/8	11 - 30	58.62	N/A	570000000 N	1400000	Reg IX PRG	NO	BSL, IFD
75-34-3	1,1-Dichloroethane	377.34	EJ	377.34	EJ	ug/kg	TP-34	1/8	11 - 30	377.34	N/A	200000000 N	7800000	EPA SSLs	NO	BSL, IFD
75-35-4	1,1-Dichloroethene	4.92	J	4.92	J	ug/kg	TP-34	1/8	11 - 30	4.92	N/A	9500 C	1000	EPA SSLs	NO	BSL, IFD
540-59-0	1,2-Dichloroethene (total)	766.31	EJ	766.31	EJ	ug/kg	TP-34	1/5	11 - 30	766.31	N/A	18000000 N	780000	EPA SSLs	NO	BSL, IFD
78-93-3	2-Butanone	4.82	J	420.00	E	ug/kg	TP-45	7/8	14	420.00	N/A	1200000000 N	28000000	Reg IX PRG	NO	BSL
67-64-1	Acetone	25.88		1600.00	EG	ug/kg	TP-45	8/8	NA	1600.00	N/A	200000000 N	7800000	EPA SSLs	NO	BSL
71-43-2	Benzene	2.20	J	26.90	J	ug/kg	TP-34	6/8	12 - 20	26.90	N/A	100000 C	22000	EPA SSLs	NO	BSL
75-15-0	Carbon Disulfide	10.00	J	130.00	G	ug/kg	TP-45	4/8	11 - 30	130.00	N/A	200000000 N	7800000	EPA SSLs	NO	BSL
108-90-7	Chlorobenzene	9.62	J	23.00	G	ug/kg	TP-45	4/8	11 - 20	23.00	N/A	41000000 N	1600000	EPA SSLs	NO	BSL
75-00-3	Chloroethane	283.28	EJ	283.28	EJ	ug/kg	TP-34	1/8	11 - 30	283.28	N/A	2000000 C	6500	Reg IX PRG	NO	BSL, IFD
67-66-3	Chloroform	6.00	J	11.00	J	ug/kg	TP-47	3/8	11 - 30	11.00	N/A	940000 C	100000	EPA SSLs	NO	BSL
100-41-4	Ethylbenzene	8.00	J	9700.00	G	ug/kg	TP-47	4/8	12 - 30	9700.00	N/A	200000000 N	7800000	EPA SSLs	NO	BSL
75-09-2	Methylene Chloride	1.59	J	15.24	J	ug/kg	TP-34	4/8	11 - 71	15.24	N/A	760000 C	85000	EPA SSLs	NO	BSL
100-42-5	Styrene	25.00	G	25.00	G	ug/kg	TP-47	1/8	11 - 30	25.00	N/A	410000000 N	16000000	EPA SSLs	NO	BSL, IFD
127-18-4	Tetrachloroethene	6.45	J	6.45	J	ug/kg	TP-34	1/8	11 - 30	6.45	N/A	110000 C	12000	EPA SSLs	NO	BSL, IFD
108-88-3	Toluene	1.44	J	147949.02	BDJ	ug/kg	TP-34	5/8	12 - 30	147949.02	N/A	410000000 N	16000000	EPA SSLs	NO	BSL
79-01-6	Trichloroethene	2.71	J	2.71	J	ug/kg	TP-34	1/8	11 - 30	2.71	N/A	520000 C	58000	EPA SSLs	NO	BSL, IFD
75-01-4	Vinyl Chloride	126.80	J	126.80	J	ug/kg	TP-34	1/8	11 - 30	126.80	N/A	3800 C	300	EPA SSLs	NO	BSL, IFD
133-02-7	Xylene (total)	0.74	G	45361.58	D	ug/kg	TP-34	4/8	11 - 30	45361.58	N/A	4100000000 N	160000000	EPA SSLs	NO	BSL
95-50-1	1,2-Dichlorobenzene	4400	J	4400	J	ug/kg	TP-34	1/8	530-8600	4400	N/A	180000000 N	7000000	EPA SSLs	NO	BSL, IFD
105-67-9	2,4-Dimethylphenol	92	J	350	J	ug/kg	TP-14	2/8	540-8600	350	N/A	41000000 N	1600000	EPA SSLs	NO	BSL
91-57-6	2-Methylnaphthalene	120	J	950	J	ug/kg	TP-14	2/8	540-8600	950	N/A	41000000 N	36400	NYS TAGM	NO	NTX, BSL
95-48-7	2-Methylphenol	250	J	250	J	ug/kg	TP-14	1/8	530-8600	250	N/A	N/A	44000000	Reg IX PRG	NO	NTX,BSL,IFD
106-44-5	4-Methylphenol	160	J	1500	J	ug/kg	TP-34	2/8	540-8600	1500	N/A	N/A	4400000	Reg IX PRG	NO	NTX,BSL,IFD

Minimum/maximum detected concentration.

(2) Total of 8 subsurface soil samples analyzed for VOCs, SVOCs, and Pest/PCBs; 12 samples analyzed for metals.

(3) Maximum concentration used for screening.

(4) Off-Site surface soil samples SS-40 and SS-41 used as background samples - Refer to text for supporting information.
Maximum analyte concentration found in two samples used as screening tool.

(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used.
(Cancer benchmark value = 1E-06; HQ=0.1)

(6) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient or common earth mineral(NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
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BDL = below detection limits

TABLE 3
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: On-Site

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	(4) Background Value	(5) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(6) Rationale for Contaminant Deletion or Selection
83-32-9	Acenaphthene	350	J	3300	J	ug/kg	TP-8	3/8	530-4800	3300	N/A	120000000 N	4700000	EPA SSLs	NO	BSL
208-96-8	Acenaphthylene	170	J	2200	J	ug/kg	TP-8	2/8	530-4800	2200	N/A	N/A	41000	NYS TAGM	NO	NTX,BSL
120-12-7	Anthracene	710		8400		ug/kg	TP-8	4/8	530-4800	8400	N/A	610000000 N	23000000	EPA SSLs	NO	BSL
56-55-3	Benzo(a)anthracene	1050	J	16000		ug/kg	TP-8	6/8	530-1900	16000	N/A	78000 C	900	EPA SSLs	YES	ASL
50-32-8	Benzo(a)pyrene	400	J	11700		ug/kg	TP-8	7/8	530	11700	N/A	780 C	90	EPA SSLs	YES	ASL
205-99-2	Benzo(b)fluoranthene	750	J	22200		ug/kg	TP-8	7/8	530	22200	N/A	7800 C	900	EPA SSLs	YES	ASL
191-24-2	Benzo(g,h,i)perylene	500	J	4400	J	ug/kg	TP-8	6/8	530-1900	4400	N/A	N/A	50000	NYS TAGM	NO	NTX, BSL
207-08-9	Benzo(k)fluoranthene	400	J	1000	J	ug/kg	TP-34	5/8	530 - 8600	1000	N/A	78000 C	9000	EPA SSLs	NO	BSL
117-81-7	Bis(2-Ethylhexyl)phthalate	550	J	19000		ug/kg	TP-8	7/8	2050	19000	N/A	410000 C	46000	EPA SSLs	NO	BSL
218-01-9	Chrysene	800	J	15400		ug/kg	TP-8	7/8	530	15400	N/A	780000 C	88000	EPA SSLs	NO	BSL
53-70-3	Dibenz(a,h)anthracene	1500	J	1500	J	ug/kg	TP-8	1/8	530-4800	1500	N/A	780 C	90	EPA SSLs	YES	ASL
132-64-9	Dibenzofuran	220	J	3100	J	ug/kg	TP-8	2/8	530-4800	3100	N/A	8200000 N	5100000	Reg IX PRG	NO	BSL
84-74-2	Di-n-Butylphthalate	1000	J	1000	J	ug/kg	TP-34	1/8	530-8600	1000	N/A	N/A	7800000	EPA SSLs	NO	BSL,IFD
206-44-0	Fluoranthene	280	J	43400		ug/kg	TP-8	7/8	1900	43400	N/A	82000000 N	3100000	EPA SSLs	NO	BSL
86-73-7	Fluorene	300	J	8300	J	ug/kg	TP-8	6/8	530 - 2050	8300	N/A	82000000 N	3100000	EPA SSLs	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	600	J	5200	J	ug/kg	TP-8	6/8	530-1900	5200	N/A	7800 C	900	EPA SSLs	YES	ASL
78-59-1	Isophorone	350	J	1850	J	ug/kg	TP-14	2/8	540-8600	1850	N/A	6000000 C	670000	EPA SSLs	NO	BSL
91-20-3	Naphthalene	120	J	1300	J	ug/kg	TP-34	4/8	540-8600	1300	N/A	41000000 N	3100000	EPA SSLs	NO	BSL
85-01-8	Phenanthrene	420	J	37200		ug/kg	TP-8	8/8	NA	37200	N/A	N/A	50000	NYS TAGM	NO	NTX,BSL
108-95-2	Phenol	500	J	500	J	ug/kg	TP-14	1/8	530-8600	500	N/A	1200000000 N	47000000	EPA SSLs	NO	BSL,IFD
129-00-0	Pyrene	340	J	39300		ug/kg	TP-8	8/8	NA	39300	N/A	61000000 N	2300000	EPA SSLs	NO	BSL
1267-229-6	Aroclor-1248	87	P	420000	PDJ	ug/kg	TP-8	7/8	520	420000	N/A	2900 C	1000	EPA SSLs	YES	ASL

Minimum/maximum detected concentration.

(2) Total of 8 subsurface soil samples analyzed for VOCs, SVOCs, and Pest/PCBs; 12 samples analyzed for metals.

(3) Maximum concentration used for screening.

(4) Off-Site surface soil samples SS-40 and SS-41 used as background samples - Refer to text for supporting information. Maximum analyte concentration found in two samples used as screening tool.

(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used. (Cancer benchmark value = 1E-06; HQ=0.1)

(6) Rationale Codes
Selection Reason:
- Infrequent Detection but Associated Historically (HIST)
- Frequent Detection (FD)
- Toxicity Information Available (TX)
- Above Screening Levels (ASL)

Deletion Reason:
- Infrequent Detection (IFD)
- Background Levels (BKG)
- No Toxicity Information (NTX)
- Essential Nutrient or common earth mineral(NUT)
- Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
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TABLE 3
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil
Exposure Point: On-Site

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	(4) Background Value	(5) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(6) Rationale for Contaminant Deletion or Selection
742-99-05	Aluminum	1600.00		20587.18		mg/kg	TP-8	12/12	NA	20587.18	11100	2000000 N	100000	Reg IX PRG	NO	BSL,BKG,NUT
7440-36-0	Antimony	1.85	BNJ	22.00	N	mg/kg	TP-46	6/12	1.4 - 4.8	22.00	BDL	820000 N	31000	EPA SSLs	NO	BSL
7440-38-2	Arsenic	2.20	N	20.80	N	mg/kg	TP-47	8/12	2.2 - 3.3	20.80	BDL	3.8 C	0.4	EPA SSLs	YES	ASL
7440-39-3	Barium	23.60	B	250.79	EJ	mg/kg	TP-8	12/12	NA	250.79	64	140000 N	5500	EPA SSLs	NO	BSL
7440-41-7	Beryllium	0.37	BNJ	1.35	BNJ	mg/kg	TP-8	5/12	0.65 - 1.1	1.35	BDL	4100 N	1.75	East U.S.	NO	BSL,NUT
7440-43-9	Cadmium	6.00		34.48	N*J	mg/kg	TP-14	8/12	1.1 - 1.1	34.48	1.4	2000 N	78	EPA SSLs	NO	BSL
7440-70-2	Calcium	22654.54		571000.00	G	mg/kg	B-23 (18-20)	12/12	NA	571000.00	12800	N/A	12800 (SB)	NYS TAGM	NO	NUT
7440-47-3	Chromium	3.20		4265.03		mg/kg	TP-8	12/12	NA	4265.03	20	N/A	390	EPA SSLs	YES	ASL,FD
7440-48-4	Cobalt	4.40	B	16.15	BNJ	mg/kg	TP-8	8/12	4.4 - 6.3	16.15	9	120000 N	100000	Reg IX PRG	NO	BSL,BKG
7440-50-8	Copper	10.60		3272.97		mg/kg	TP-8	12/12	NA	3272.97	23	82000 N	76000	Reg IX PRG	NO	BSL
7439-89-6	Iron	4900.00		54496.93	*J	mg/kg	TP-14	12/12	NA	54496.93	16400	610000 N	100000	Reg IX PRG	NO	BSL,NUT
7439-92-1	Lead	2.20		417.91	NJ	mg/kg	TP-8	12/12	NA	417.91	20	N/A	400	EPA SSLs	YES	ASL,FD,TX
7439-95-4	Magnesium	1644.95		23336.41		mg/kg	TP-8	12/12	NA	23336.41	7410	N/A	7410 (SB)	NYS TAGM	NO	NUT
7439-96-5	Manganese	161.78	N*J	1921.91	N*J	mg/kg	TP-14	12/12	NA	1921.91	509	290000 N	32000	Reg IX PRG	NO	BSL
7439-97-6	Mercury	0.15		0.87		mg/kg	TP-46	4/12	0.11 - 6.7	0.87	BDL	N/A	23	EPA SSLs	NO	BSL
7440-02-0	Nickel	7.40	B	1400.00		mg/kg	TP-46	10/12	6.7 - 6.7	1400.00	16	41000 N	1600	EPA SSLs	NO	BSL
7440-09-7	Potassium	386.00	B	2721.59		mg/kg	TP-8	12/12	NA	2721.59	982	N/A	982 (SB)	NYS TAGM	NO	NUT
7782-49-2	Selenium	8.10	N	18.50	N	mg/kg	B-23 (18-20)	7/12	1.1 - 2.6	18.50	9	10000 N	390	EPA SSLs	NO	BSL
7440-22-4	Silver	5.07	BNJ	10.10		mg/kg	TP-45	3/12	0.4 - 3.2	10.10	BDL	10000 N	390	EPA SSLs	NO	BSL
7440-23-5	Sodium	950.32	BJ	1972.36	B	mg/kg	TP-8	5/12	216 - 359	1972.36	BDL	N/A	SB	NYS TAGM	NO	NUT
7440-28-0	Thallium	1.65	BNJ	4.00		mg/kg		7/12	1 - 3	4.00	BDL	140 N	130	Reg IX PRG	NO	BSL
7440-62-2	Vanadium	8.20	B	46.31	EJ	mg/kg	TP-8	8/12	6.7 - 10.8	46.31	22	14000 N	550	EPA SSLs	NO	BSL
7440-66-6	Zinc	13.00	E	1324.62		mg/kg	TP-8	12/12	NA	1324.62	62	610000 N	23000	EPA SSLs	NO	BSL

Minimum/maximum detected concentration.

(2) Total of 8 subsurface soil samples analyzed for VOCs, SVOCs, and Pest/PCBs; 12 samples analyzed for metals.

(3) Maximum concentration used for screening.

(4) Off-Site surface soil samples SS-40 and SS-41 used as background samples - Refer to text for supporting information. Maximum analyte concentration found in two samples used as screening tool.

(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used. (Cancer benchmark value = 1E-06; HQ=0.1)

(6) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient or common earth mineral(NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
EPA SSLs= EPA Generic Soil Screening Levels.
Reg IX PRG = EPA Region IX Preliminary Remediation Goals.
NYS TAGM = New York State Technical Administrative Guidance Manual (soil guidance values).
East U.S.= Eastern U.S. background range
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 4
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: On-Site

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value	(4) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(5) Rationale for Contaminant Deletion or Selection
71-55-6	1,1,1-Trichloroethane	4.45	J	2800.00	DJ	ug/l	MW-10	3/17	10 - 20	2800.00	N/A	3200 N	200	MCL	YES	ASL
75-34-3	1,1-Dichloroethane	2.54	J	570.00	EJ	ug/l	MW-10	2/17	10 - 20	570.00	N/A	800 N	810	Reg IX PRG	NO	BSL, IFD
75-35-4	1,1-Dichloroethene	360.00	EG	360.00	EG	ug/l	MW-10	1/17	10 - 20	360.00	N/A	0.044 C	7	MCL	YES	ASL
540-59-0	1,2-Dichloroethene (total)	11.63		38011.00	DG	ug/l	MW-10	4/17	10 - 20	38011.00	N/A	55 N	NA	NA	YES	ASL
67-64-1	Acetone	40.00		40.00		ug/l	MW-0	1/17	10 - 20	40.00	N/A	610 N	50	NYS TOGS	NO	BSL,IFD
71-43-2	Benzene	2.69	J	29.00	G	ug/l	MW-10	3/17	10 -20	29.00	N/A	0.32 C	5	MCL	YES	ASL
108-90-7	Chlorobenzene	1.00	J	23.00		ug/l	MW-8	5/17	10 - 20	23.00	N/A	110 N	110	Reg IX PRG	NO	BSL
75-00-3	Chloroethane	9.44	J	94.22		ug/l	MW-3	3/17	10 - 20	94.22	N/A	3.6 C	4.6	Reg IX PRG	YES	ASL
74-87-3	Chloromethane	6.71	J	47.00	G	ug/l	MW-10	2/17	10 - 20	47.00	N/A	2.1 C	1.5	Reg IX PRG	YES	ASL
100-41-4	Ethylbenzene	3100.00	DJ	3100.00	DJ	ug/l	MW-10	1/17	10 - 20	3100.00	N/A	1300 N	700	MCL	NO	IFD
127-18-4	Tetrachloroethene	6.00	G	6.00	G	ug/l	MW-10	1/17	10 - 20	6.00	N/A	1.1 C	5	MCL	NO	IFD
108-88-3	Toluene	3.00	BJ	61000.00	DG	ug/l	MW-10	10/17	10 -20	61000.00	N/A	750 N	1000	MCL	YES	ASL
542-75-6	trans-1,3-Dichloropropene	124.81		124.81		ug/l	MW-15	1/17	10 - 20	124.81	N/A	NA	NA	NA	NO	IFD,NTX
79-01-6	Trichloroethene	1.68	J	570.00	EG	ug/l	MW-10	3/17	10 - 20	570.00	N/A	1.6 C	5	MCL	YES	ASL
75-01-4	Vinyl Chloride	106.66		740.00	EG	ug/l	MW-10	2/17	10 - 20	740.00	N/A	0.04 C	2	MCL	YES	ASL
133-02-7	Xylene (total)	1.43	J	17900.00	DJ	ug/l	MW-10	5/17	10 - 20	17900.00	N/A	12000 N	10000	MCL	YES	ASL
95-50-1	1,2-Dichlorobenzene	3.52	J	5.00	J	ug/l	MW-10	2/17	9 - 10	5.00	N/A	550 N	600	MCL	NO	BSL,IFD
106-46-7	1,4-Dichlorobenzene	2.35	J	9.00	J	ug/l	MW-10	4/17	9 - 10	9.00	N/A	0.47 C	75	MCL	YES	ASL
105-67-9	2,4-Dimethylphenol	20.00	G	20.00	G	ug/l	MW-10	1/17	9 - 10	20.00	N/A	730 N	730	Reg IX PRG	NO	BSL, IFD
91-58-7	2-Chloronaphthalene	1.97	J	1.97	J	ug/l	MW-3	1/17	9 - 10	1.97	N/A	N/A	10	NYS TOGS	NO	BSL,IFD,NTX

(1) Minimum/maximum detected concentration.

(2) Total of 17 groundwater samples used in COC screening. Only total metals concentrations used for groundwater evaluation.

(3) Maximum concentration used for screening.

(4) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Tap Water used.
(Cancer benchmark value = 1E-06; HQ=0.1)

(5) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
Reg IX PRG = EPA Region IX Preliminary Remediation Goals
NYS TOGS = New York State Technical and Operational Guidance Series for groundwater criteria.
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 4
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value	Screening Toxicity Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
91-57-6	2-Methylnaphthalene	1.68	J	9.00	J	ug/l	MW-10	3/17	9 - 10	9.00	N/A	120 N	N/A	N/A	NO	BSL
95-48-7	2-Methylphenol	78.00	G	78.00	G	ug/l	MW-10	1/17	9 - 10	78.00	N/A	1800 N	1800	Reg IX PRG	NO	BSL,IFD
106-44-5	4-Methylphenol	2.24	J	130.00	D	ug/l	MW-10	2/17	9 - 10	130.00	N/A	180 N	180	Reg IX PRG	NO	BSL,IFD
117-81-7	Bis(2-Ethylhexyl)phthalate	1.44	J	17.00		ug/l	MW-9	4/17	9 - 10	17.00	N/A	4.8 C	4.8	Reg IX PRG	NO	IFD
85-68-7	Butylbenzylphthalate	1.00	J	5.17	J	ug/l	MW-9	5/17	9 - 10	5.17	N/A	7300 N	7300	Reg IX PRG	NO	BSL
84-66-2	Diethylphthalate	1.02	J	16.00	G	ug/l	MW-10	3/17	9 - 10	16.00	N/A	29000 N	29000	Reg IX PRG	NO	BSL
84-74-2	Di-n-Butylphthalate	2.00	J	10.00	G	ug/l	MW-10	2/17	9 - 10	10.00	N/A	N/A	NA	NA	NO	NTX,IFD
86-73-7	Fluorene	1.04	J	1.04	J	ug/l	MW-15	1/17	9 - 10	1.04	N/A	240 N	240	Reg IX PRG	NO	BSL, IFD
91-20-3	Naphthalene	1.14	J	36.00	G	ug/l	MW-10	4/17	9 - 10	36.00	N/A	6.5 N	6.2	Reg IX PRG	YES	ASL
85-01-8	Phenanthrene	1.25	J	1.25	J	ug/l	MW-15	1/17	9 - 10	1.25	N/A	N/A	50	NYS TOGS	NO	NTX,IFD,BSL
50-29-3	4,4'-DDT	0.015	JP	0.015	JP	ug/l	MW-3	1/17	0.095 - 0.47	0.015	N/A	0.2 C	0.2	Reg IX PRG	NO	BSL, IFD
30-90-2	Aldrin	0.0098	JP	0.0098	JP	ug/l	MW-12	1/17	0.047 - 0.05	0.0098	N/A	0.0039 C	0.004	Reg IX PRG	YES	ASL
31-98-36	BHC-alpha	0.0033	JP	0.0033	JP	ug/l	MW-12	1/17	0.047 - 0.05	0.0033	N/A	0.011 C	0.011	Reg IX PRG	NO	BSL,IFD
72-20-8	Endrin	0.0025	J	0.0025	J	ug/l	MW-7	1/17	0.094 - 0.10	0.0025	N/A	11 N	2	MCL	NO	BSL,IFD
76-44-8	Heptachlor	0.0016	JP	0.0016	JP	ug/l	MW-7	1/17	0.047 - 0.05	0.0016	N/A	0.015 C	0.4	MCL	NO	BSL,IFD
72-43-5	Methoxychlor	0.012	JP	0.055	JP	ug/l	MW-8	5/17	0.47 - 0.50	0.055	N/A	180 N	40	MCL	NO	BSL
12672-29-6	Aroclor-1248	0.18	JP	1.6		ug/l	MW-8	6/17	0.05 - 0.95	1.6	N/A	0.033 C	0.5	MCL	YES	ASL
7429-90-5	Aluminum	66.98	B	32444.00		ug/l	MW-6	17/17	NA	32444.00	N/A	37000 N	50	SMCL	NO	BSL, NUT
7440-36-0	Antimony	9.00	B	9.00	B	ug/l	MW-8	1/17	5.6 - 15	9.00	N/A	15 N	6	MCL	NO	IFD
7440-38-2	Arsenic	5.02	B	73.57		ug/l	MW-6	9/17	3.6 - 10	73.57	N/A	0.045 C	50	MCL	YES	ASL

(1) Minimum/maximum detected concentration.
(2) Total of 17 groundwater samples used in COC screening. Only total metals concentrations used for groundwater evaluation.
(3) Maximum concentration used for screening.

(4) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Tap Water used.
(Cancer benchmark value = 1E-06; HQ=0.1)
(5) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
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J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 4
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value	Screening Toxicity Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
7440-39-3	Barium	29.43	EJ	849.28		ug/l	MW-3	17/17	NA	849.28	N/A	2600 N	2000	MCL	NO	BSL
7440-41-7	Beryllium	1.72	B	1.72	B	ug/l	MW-6	1/17	1 - 3	1.72	N/A	73 N	4	MCL	NO	BSL,IFD
7440-43-9	Cadmium	1.41	B	34.00		ug/l	MW-1	14/17	0.5 - 5	34.00	N/A	18 N	5	MCL	YES	ASL
7440-70-2	Calcium	122060.00	NJ	341100.00	NJ	ug/l	MW-5	17/17	NA	341100.00	N/A	N/A	NA	NA	NO	NUT,NTX
7440-47-3	Chromium	2.77	B	309.00		ug/l	MW-10	13/17	1.8 - 1.8	309.00	N/A	N/A	100	MCL	YES	ASL
7440-48-4	Cobalt	1.47	B	50.70		ug/l	MW-10	15/17	1.3 - 1.3	50.70	N/A	2200 N	2200	Reg IX PRG	NO	BSL
7440-50-8	Copper	2.05	B	70.70		ug/l	MW-10	14/17	1.6 - 1.6	70.70	N/A	1500 N	1300	MCL	NO	BSL
7439-89-6	Iron	700.52		56000.00		ug/l	MW-6	17/17	NA	56000.00	N/A	11000 N	300	SMCL	NO	NUT
7439-92-1	Lead	2.00	J	52.16		ug/l	MW-15	14/17	2 - 2	52.16	N/A	N/A	15	MCL	YES	FD,ASL,TX
7439-95-4	Magnesium	28738.00		117800.00		ug/l	MW-5	17/17	NA	117800.00	N/A	N/A	35000	NYS TOGS	NO	NUT,NTX
7439-96-5	Manganese	33.36		3710.00		ug/l	MW-10	17/17	NA	3710.00	N/A	730 N	50	SMCL	YES	ASL,FD
7440-02-0	Nickel	6.75	B	269.00		ug/l	MW-10	14/17	1.9 - 1.9	269.00	N/A	730 N	1000	MCL	NO	BSL
7440-09-7	Potassium	2880.50	B	141530.00		ug/l	MW-3	5/5	NA	141530.00	N/A	N/A	NA	NA	NO	NUT
7440-22-4	Silver	4.11	B	4.11	B	ug/l	MW-8	1/17	1.6 - 10	4.11	N/A	180 N	180	Reg IX PRG	NO	BSL,IFD
7440-23-5	Sodium	22600.00		1256700.00	EJ	ug/l	MW-5D	17/17	NA	1256700.00	N/A	N/A	20000	NYS TOGS	NO	NUT
7440-28-0	Thallium	5.80	J	5.80	J	ug/l	MW-3, -12, -12D	3/17	5.8 - 10	5.80	N/A	2.6 N	2	MCL	NO	IFD
7440-62-2	Vanadium	1.96	B	51.28		ug/l	MW-6	13/17	1.3 - 1.3	51.28	N/A	260 N	260	Reg IX PRG	NO	BSL
7440-66-6	Zinc	6.07	*	255.00		ug/l	MW-10	5/5	NA	255.00	N/A	11000 N	11000	Reg IX PRG	NO	BSL
57-12-5	Cyanide	14.80		16.40		ug/l	MW-15	2/17	10 - 10	16.40	N/A	N/A	200	MCL	NO	BSL

(1) Minimum/maximum detected concentration.

(2) Total of 17 groundwater samples used in COC screening. Only total metals concentrations used for groundwater evaluation.

(3) Maximum concentration used for screening.

(4) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Tap Water used.
(Cancer benchmark value = 1E-06; HQ=0.1)

(5) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
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Definitions:
N/A = Not Applicable
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N = Non-Carcinogenic
BDL = below detection limits

TABLE 5
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value (4)	Screening Toxicity Value (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
67-64-1	Acetone	24.05		137.57		ug/kg	SED-24	9/10	16 - 16	137.57	N/A	200000000 N	7800000	EPA SSLs	NO	BSL
75-09-2	Methylene Chloride	3.33	J	6.77	J	ug/kg	SED-25	3/10	14 - 47	6.77	N/A	760000 C	85000	EPA SSLs	NO	BSL
133-02-7	Xylene (total)	4.74	J	4.74	J	ug/kg	SED-22	1/10	14 - 49	4.74	N/A	4100000000 N	160000000	EPA SSLs	NO	BSL,IFD
51-28-5	2,4-Dinitrophenol	2000	J	2000	J	ug/kg	SED-22D	1/10	1300 - 135500	2000	N/A	4100000 N	160000	EPA SSLs	NO	BSL,IFD
121-14-2	2,4-Dinitrotoluene	2000	J	2000	J	ug/kg	SED-22D	1/10	520 - 54000	2000	N/A	4100000 N	900	EPA SSLs	NO	IFD
83-32-9	Acenaphthene	300	J	2900		ug/kg	SED-22	3/10	520 - 54000	2900	N/A	120000000 N	4700000	EPA SSLs	NO	BSL
208-96-8	Acenaphthylene	400	J	1050	J	ug/kg	SED-22	5/10	520 - 54000	1050	N/A	N/A	41000	NYS TAGM	NO	NTX,BSL
120-12-7	Anthracene	310	J	2550		ug/kg	SED-22	8/10	510 - 1840	2550	N/A	610000000 N	23000000	EPA SSLs	NO	BSL
56-55-3	Benzo(a)anthracene	1230	J	9100		ug/kg	SED-22	8/10	520 - 1870	9100	N/A	78000 C	900	EPA SSLs	YES	ASL
50-32-8	Benzo(a)pyrene	1090	J	7450		ug/kg	SED-22	8/10	520 - 1870	7450	N/A	780 C	90	EPA SSLs	YES	ASL
205-99-2	Benzo(b)fluoranthene	1560		11700		ug/kg	SED-22	8/10	520 - 1870	11700	N/A	7800 C	900	EPA SSLs	YES	ASL
191-24-2	Benzo(g,h,i)perylene	270	J	2000	J	ug/kg	SED-22	7/10	520 - 2650	2000	N/A	N/A	50000	NYS TAGM	NO	NTX,BSL
207-08-9	Benzo(k)fluoranthene	470	J	2700	J	ug/kg	SED-22D	7/10	520 - 2650	2700	N/A	78000 C	9000	EPA SSLs	NO	BSL
117-81-7	Bis(2-Ethylhexyl)phtha	110	J	8000	J	ug/kg	SED-24	9/10	1870 - 1870	8000	N/A	410000 C	46000	EPA SSLs	NO	BSL
86-74-8	Carbazole	400	J	900	J	ug/kg	SED-22	3/10	520 - 54000	900	N/A	290000 C	32000	EPA SSLs	NO	BSL
218-01-9	Chrysene	1250	J	10150		ug/kg	SED-22	8/10	520 - 1870	10150	N/A	780000 C	88000	EPA SSLs	NO	BSL
53-70-3	Dibenz(a,h)anthracene	500	J	900	J	ug/kg	SED-22	4/10	520 - 54000	900	N/A	780 C	90	EPA SSLs	YES	ASL
132-64-9	Dibenzofuran	600	J	600	J	ug/kg	SED-22	1/10	520 - 54000	600	N/A	8200000 N	5100000	Reg IX PRG	NO	BSL,IFD
84-74-2	Di-n-Butylphthalate	70	J	1800	J	ug/kg	SED-22D	2/10	1560 - 54000	1800	N/A	N/A	7800000	EPA SSLs	NO	BSL
206-44-0	Fluoranthene	2940		19150		ug/kg	SED-22	8/10	520 - 1870	19150	N/A	82000000 N	3100000	EPA SSLs	NO	BSL
86-73-7	Fluorene	600	J	4,100		ug/kg	SED-22	6/10	510 - 3300	4,100	N/A	82000000 N	3100000	EPA SSLs	NO	BSL
193-39-5	Indeno(1,2,3-cd)pyrene	400	J	3200		ug/kg	SED-22	7/10	520 - 2650	3200	N/A	7800 C	900	EPA SSLs	YES	ASL
85-01-8	Phenanthrene	1010	J	9500		ug/kg	SED-22	8/10	520 - 1870	9500	N/A	N/A	50000	NYS TAGM	NO	NTX,BSL
129-00-0	Pyrene	1920		23700	EJ	ug/kg	SED-21	8/10	520 - 1870	23700	N/A	61000000 N	2300000	EPA SSLs	NO	BSL
12672-29-6	Aroclor-1248	2100	PJ	81000	PJ	ug/kg	SED-22D	8/10	50 - 180	81000	N/A	2900 C	1000	EPA SSLs	YES	ASL
11096-82-5	Aroclor-1260	280	JPX	4800	J	ug/kg	SED-21D	8/10	50 - 180	4800	N/A	2900 C	1000	EPA SSLs	YES	ASL

(1) Minimum/maximum detected concentration.

(2) Total of 10 sediment samples (from Ley Creek and on-site drainageways) used in COC screen. Refer to text for further discussion.

(3) Maximum concentration used for screening.

(4) Off-Site sample SED-20 used as background sample - Refer to text for supporting information.

(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used. (Cancer benchmark value = 1E-06; HQ=0.1)

(6) Rationale Codes

Selection Reason:
- Infrequent Detection but Associated Historically (HIST)
- Frequent Detection (FD)
- Toxicity Information Available (TX)
- Above Screening Levels (ASL)

Deletion Reason:
- Infrequent Detection (IFD)
- Background Levels (BKG)
- No Toxicity Information (NTX)
- Essential Nutrient or common earth mineral (NUT)
- Below Screening Level (BSL)

Definitions:
- N/A = Not Applicable
- SQL = Sample Quantitation Limit
- COPC = Chemical of Potential Concern
- ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
- EPA SSLs= EPA Generic Soil Screening Levels.
- Reg IX PRG = EPA Region IX Preliminary Remediation Goals.
- NYS TAGM = New York State Technical Administrative Guidance Manual (soil guidance values).
- East U.S.= Eastern U.S. background range.
- J = Estimated Value
- C = Carcinogenic
- N = Non-Carcinogenic
- BDL = below detection limits

TABLE 5
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value (4)	Screening Toxicity Value (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
742-99-05	Aluminum	2087.17		28287.67		mg/kg	SED-24D	10/10	N/A	28287.67	11074	2000000 N	100000	Reg IX PRG	NO	BSL,NUT
7440-38-2	Arsenic	5.27	B	25.74		mg/kg	SED-24D	10/10	N/A	25.74	7	3.8 C	0.4	EPA SSLs	YES	ASL,FD
7440-39-3	Barium	58.40	B	387.52		mg/kg	SED-24D	10/10	N/A	387.52	73.8	140000 N	5500	EPA SSLs	NO	BSL
7440-41-7	Beryllium	0.35	B	1.62	B	mg/kg	SED-24D	6/10	0.3 - 1.1	1.62	0.6	4100 N	1.75	East U.S.	NO	BSL,NUT
7440-43-9	Cadmium	5.28		83.68		mg/kg	SED-24D	10/10	N/A	83.68	13.2	2000 N	78	EPA SSLs	YES	ASL
7440-70-2	Calcium	35407.43	*J	144801.55	*J	mg/kg	SED-24D	10/10	N/A	144801.55	39731	N/A	39731 (SB)	NYS TAGM	NO	NUT
7440-47-3	Chromium	5.29	BN*J	1766.68	N*J	mg/kg	SED-24	10/10	N/A	1766.68	84	N/A	390	EPA SSLs	YES	ASL
7440-48-4	Cobalt	1.73	B	31.12	B	mg/kg	SED-24D	10/10	N/A	31.12	10.4	120000 N	100000	Reg IX PRG	NO	BSL
7440-50-8	Copper	12.71		498.16	N*J	mg/kg	SED-24D	10/10	N/A	498.16	80	82000 N	76000	Reg IX PRG	NO	BSL
7439-89-6	Iron	7399.83		57252.37		mg/kg	SED-24D	10/10	N/A	57252.37	20688	610000 N	100000	Reg IX PRG	NO	BSL
7439-92-1	Lead	8.15	*J	8.15	*J	mg/kg	SED-25	1/1	N/A	8.15	BDL	N/A	400	EPA SSLs	NO	BSL
7439-95-4	Magnesium	3233.20	B*J	37003.86	*J	mg/kg	SED-24D	10/10	N/A	37003.86	11019	N/A	11019 (SB)	NYS TAGM	NO	NUT
7439-96-5	Manganese	181.46	NJ	1132.51	NJ	mg/kg	SED-24D	10/10	N/A	1132.51	728	290000 N	32000	Reg IX PRG	NO	BSL,BKG
7439-97-6	Mercury	0.15	EJ	0.74		mg/kg	SED-24D	8/10	0.2 - 0.52	0.74	BDL	N/A	23	EPA SSLs	NO	BSL
7440-02-0	Nickel	11.41	BN*J	363.00	N*J	mg/kg	SED-24D	9/10	11.4	363.00	47	41000 N	1600	EPA SSLs	NO	BSL
7440-09-7	Potassium	217.59	BEJ	4895.68	EJ	mg/kg	SED-24D	10/10	N/A	4895.68	1561	N/A	1561 (SB)	NYS TAGM	NO	NUT
7782-49-2	Selenium	1.97	BNJ	1.97	BNJ	mg/kg	SED-23	1/10	1.5 - 5.3	1.97	BDL	10000 N	390	EPA SSLs	NO	BSL
7440-22-4	Silver	1.72	B	8.69	BNJ	mg/kg	SED-24D	8/10	0.5 - 1.7	8.69	BDL	10000 N	390	EPA SSLs	NO	BSL
7440-23-5	Sodium	1165.51	B	4665.88		mg/kg	SED-24D	9/10	1319	4665.88	2156	N/A	2156 (SB)	NYS TAGM	NO	NUT
7440-28-0	Thallium	2.28	ENJ	2.28	ENJ	mg/kg	SED-23	1/10	1.7 - 6.1	2.28	BDL	140 N	130	Reg IX PRG	NO	BSL
7440-62-2	Vanadium	11.82	B	76.71		mg/kg	SED-24D	10/10	N/A	76.71	22.3	14000 N	550	EPA SSLs	NO	BSL
7440-66-6	Zinc	44.06	ENJ	1185.11	ENJ	mg/kg	SED-24D	10/10	N/A	1185.11	106	610000 N	23000	EPA SSLs	NO	BSL
57-12-5	Cyanide	2.24	NJ	11.67	NJ	mg/kg	SED-24	7/10	1 - 3	11.67	4	N/A	NA	NA	NO	NTX

(1) Minimum/maximum detected concentration.
(2) Total of 10 sediment samples (from Ley Creek and on-site drainageways) used in COC screen. Refer to text for further discussion.
(3) Maximum concentration used for screening.
(4) Off-Site sample SED-20 used as background sample - Refer to text for supporting information.
(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Industrial soil used.
(Cancer benchmark value = 1E-06; HQ=0.1)
(6) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)
No Toxicity Information (NTX)
Essential Nutrient or common earth mineral (NUT)
Below Screening Level (BSL)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
EPA SSLs= EPA Generic Soil Screening Levels.
Reg IX PRG = EPA Region IX Preliminary Remediation Goals.
NYS TAGM = New York State Technical Administrative Guidance Manual (soil guidance values).
East U.S.= Eastern U.S. background range.
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 6
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value (4)	Screening Toxicity Value (5)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (6)
207-08-9	Benzo(k)fluoranthene	10	J	10	J	ug/l	SW-23, -24	2/5	9 - 10	10	N/A	0.92 C	0.92	Reg IX PRG	YES	ASL
12672-29-6	Aroclor-1248	0.095	JP	0.14	JP	ug/l	SW-23	2/5	0.94 - 0.95	0.14	N/A	0.033 C	0.5	MCL	YES	ASL
742-99-05	Aluminum	136.56		237.65		ug/l	SW-24	5/5	NA	237.65	217	37000 N	50	SMCL	NO	NUT,BKG,BSL
7440-39-3	Barium	50.18	B	77.83	B	ug/l	SW-24	5/5	NA	77.83	63.9	2600 N	2000	MCL	NO	BKG,BSL
7440-70-2	Calcium	40240.00		94166.00		ug/l	SW-23	5/5	NA	94166.00	70050	N/A	NA	NA	NO	NUT,BKG,NTX
7440-47-3	Chromium	2.29	B	2.29	B	ug/l	SW-24	1/5	1.8 - 1.8	2.29	BDL	N/A	100	MCL	NO	BSL,IFD
7440-48-4	Copper	6.44	B	12.71	B	ug/l	SW-25	5/5	NA	12.71	5.5	1500 N	1300	MCL	NO	BSL
7439-89-6	Iron	444.39		701.59		ug/l	SW-24	5/5	NA	701.59	576.4	11000 N	300	SMCL	NO	NUT,BKG
7439-92-1	Lead	2.07	J	5.56	J	ug/l	SW-24	5/5	NA	5.56	3.3	N/A	15	MCL	NO	BKG,BSL
7439-95-4	Magnesium	8358.50		16045.00		ug/l	SW-24	5/5	NA	16045.00	11143	N/A	35000	NYS TOGS	NO	NTX,BKG,BSL,NUT
7439-96-5	Manganese	80.21		217.25		ug/l	SW-25	5/5	NA	217.25	80.8	730 N	50	SMCL	YES	ASL
7440-02-0	Nickel	2.36	B	2.96	B	ug/l	SW-24	4/5	1.9 - 1.9	2.96	1.9	730 N	1000	MCL	NO	BSL,BKG
7440-09-7	Potassium	3664.90	B	4096.00	B	ug/l	SW-24	5/5	NA	4096.00	3862	N/A	NA	NA	NO	NUT,BKG,NTX
7440-23-5	Sodium	50466.00		85413.00		ug/l	SW-24	5/5	NA	85413.00	57471	N/A	20000	NYS TOGS	NO	NUT,BKG,NTX
7440-62-2	Vanadium	1.49	B	1.79	B	ug/l	SW-23	3/5	1.3 - 1.3	1.79	1.3	260 N	260	Reg IX PRG	NO	BSL,BKG
7440-66-6	Zinc	18.95	B	53.10		ug/l	SW-22	5/5	NA	53.10	19	11000 N	11000	Reg IX PRG	NO	BSL
57-12-5	Cyanide	13.60		18.60		ug/l	SW-21	3/5	10 - 10	18.60	BDL	N/A	200	MCL	NO	NTX,BSL

(1) Minimum/maximum detected concentration.

(2) Total of 5 surface water samples from Ley Creek and on-site drainageways used in COC screening.

(3) Maximum concentration used for screening.

(4) Off-Site sample SW-20 used as background sample - Refer to text for supporting information.

(5) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Tap Water used.
(Cancer benchmark value = 1E-06; HQ=0.1)

(6) Rationale Codes Selection Reason: Infrequent Detection but Associated Historically (HIST)
Frequent Detection (FD)
Toxicity Information Available (TX)
Above Screening Levels (ASL)
Deletion Reason: Infrequent Detection (IFD)
Background Levels (BKG)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
MCL = Federal Maximum Contaminant Level
SMCL = Secondary Maximum Contaminant Level
Reg IX PRG = EPA Region IX Preliminary Remediation Goals
NYS TOGS = New York State Technical and Operational Guidance Series for groundwater criteri
J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 7
TOWN OF SALINA LANDFILL
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Current/Future
Medium: Leachate
Exposure Medium: Leachate
Exposure Point: On-Site

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits	Concentration (3) Used for Screening	Background Value	Screening Toxicity Value (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
71-43-2	Benzene	3.8	J	3.8	J	ug/l	L-1	1/3	10 - 10	3.8	N/A	0.32 C	5	MCL	YES	ASL,TX
108-90-7	Chlorobenzene	10.3		22		ug/l	L-1	2/3	10	22	N/A	110 N	110	Reg IX PRG	NO	BSL
106-46-7	1,4-Dichlorobenzene	2	J	2.2	J	ug/l	L-1	2/3	10	2.2	N/A	0.47 C	75	MCL	YES	ASL
12672-29-6	Aroclor-1248	0.70	JP	1.00	JP	ug/l	L-1, -2	3/3	NA	1.00	N/A	0.033 C	0.5	MCL	YES	ASL
7429-90-5	Aluminum	1051.50	ENJ	12131.00	ENJ	ug/l	L-2	3/3	NA	12131.00	N/A	37000 N	50	SMCL	NO	BSL,NUT
7440-39-3	Barium	460.40	EJ	1501.60	EJ	ug/l	L-2	3/3	NA	1501.60	N/A	2600 N	2000	MCL	NO	BSL
7440-70-2	Calcium	219970.00	ENJ	263910.00	ENJ	ug/l	L-2	3/3	NA	263910.00	N/A	N/A	NA	NA	NO	NTX,NUT
7440-47-3	Chromium	42.10	EJ	125.69	EJ	ug/l	L-2	3/3	NA	125.69	N/A	N/A	100	MCL	YES	ASL
7440-48-4	Cobalt	3.36	B	13.04	B		L-2	3/3	NA	13.04	N/A	2200 N	2200	Reg IX PRG	NO	BSL
7440-50-8	Copper	29.99	EJ	140.39	EJ	ug/l	L-2	3/3	NA	140.39	N/A	1500 N	1300	MCL	NO	BSL
7439-89-6	Iron	31183.00	EJ	156090.00	EJ	ug/l	L-2	3/3	NA	156090.00	N/A	11000 N	300	SMCL	NO	NUT
7439-92-1	Lead	29.43	EJ	198.93	EJ	ug/l	L-2	3/3	NA	198.93	N/A	N/A	15	MCL	YES	ASL,TX
7439-95-4	Magnesium	52694.00	EJ	69371.00	EJ	ug/l	L-2	3/3	NA	69371.00	N/A	N/A	35000	NYS TOGS	NO	NUT
7439-96-5	Manganese	412.49	EJ	1000.80	EJ	ug/l	L-6	3/3	NA	1000.80	N/A	730 N	50	SMCL	YES	ASL
7440-02-0	Nickel	40.36		63.09		ug/l	L-6	3/3	NA	63.09	N/A	730 N	1000	MCL	NO	BSL
7440-09-7	Potassium	42867.00	EJ	66501.00	EJ	ug/l	L-6	3/3	NA	66501.00	N/A	N/A	NA	NA	NO	NUT
7440-22-4	Silver	1.60	B	1.60	B	ug/l	L-2	1/3	1.6 - 1.6	1.60	N/A	180 N	180	Reg IX PRG	NO	BSL
7440-23-5	Sodium	67612.00	EJ	190190.00	EJ	ug/l	L-6	3/3	NA	190190.00	N/A	N/A	20000	NYS TOGS	NO	NUT
7440-62-2	Vanadium	19.33	B	19.33	B	ug/l	L-2	1/3	1.3 - 1.3	19.33	N/A	260 N	260	Reg IX PRG	NO	BSL
7440-66-6	Zinc	91.08	EJ	403.63	EJ	ug/l	L-2	3/3	NA	403.63	N/A	11000 N	11000	Reg IX PRG	NO	BSL

(1) Minimum/maximum detected concentration.
(2) Total of 3 on-site leachate samples used in COC screening.

(3) Maximum concentration used for screening.
(4) Risk-Based Concentration Table, Oct. 5, 2000. USEPA Region III. Values for Tap Water used.
(Cancer benchmark value = 1E-06; HQ=0.1)
(5) Rationale Codes

Selection Reason:
- Infrequent Detection but Associated Historically (HIST)
- Frequent Detection (FD)
- Toxicity Information Available (TX)
- Above Screening Levels (ASL)

Deletion Reason:
- Infrequent Detection (IFD)
- Background Levels (BKG)
- No Toxicity Information (NTX)
- Essential Nutrient (NUT)

Definitions:
N/A = Not Applicable
SQL = Sample Quantitation Limit
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
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Reg IX PRG = EPA Region IX Preliminary Remediation Goals
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J = Estimated Value
C = Carcinogenic
N = Non-Carcinogenic
BDL = below detection limits

TABLE 8
TOWN OF SALINA LANDFILL
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: On-Site

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Benzo(a)anthracene	ug/kg	1988.15	N/A (1)	8800	D	mg/kg	7.77	95% UCL -T	W- Test (1)
Benzo(a)pyrene	ug/kg	1879.37	N/A (1)	8700	D	mg/kg	7.77	95% UCL -T	W- Test (1)
Benzo(b)fluoranthene	ug/kg	3131.48	N/A (1)	13900		mg/kg	12.6	95% UCL -T	W- Test (1)
Dibenz(a,h)anthracene	ug/kg	494.16	N/A (1)	960		mg/kg	0.96	Max	W- Test (1,2)
Indeno(1,2,3-cd)pyrene	ug/kg	1548.74	N/A (1)	5000	D	mg/kg	4.8	95% UCL -T	W- Test (1)
Aroclor 1248	ug/kg	491.76	N/A (1)	8400	J	mg/kg	1.08	95% UCL -T	W- Test (1)
Arsenic	mg/kg	2.18	N/A (1)	7		mg/kg	4.74	95% UCL -T	W- Test (1)
Lead	mg/kg	136	N/A (1)	1163		mg/kg	383.6	95% UCL -T	W- Test (1)

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T).

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
(1) Shapiro-Wilk W Tset indicates that data are log-normally distributed.
(2) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.
Lower of maximum concentration and 95% UCL concentration selected as medium EPC value.

TABLE 9
TOWN OF SALINA LANDFILL
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface Soil	On-Site	Trespasser	Adult	Dermal	On-Site	Quant	Historic waste disposal and surface runoff, tracking, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
					Child	Dermal	On-Site	Quant	Historic waste disposal and surface runoff, tracking, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	On-site area is mostly vegetated; generation of fugitive dusts expected to be minimal. No VOCs were identified as COCs in surface soils. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	On-site area is mostly vegetated; generation of fugitive dusts expected to be minimal. No VOCs were identified as COCs in surface soils. Pathway excluded from further analysis.
	Subsurface Soil	Subsurface Soil	On-Site	Trespasser	Adult	Dermal	On-Site	none	Although potential COCs exist in subsurface soil, no significant exposure routes were identified in the current land use scenario. Pathways excluded from further analysis.
						Ingestion	On-Site	none	
					Child	Dermal	On-Site	none	Although potential COCs exist in subsurface soil, no significant exposure routes were identified in the current land use scenario. Pathways excluded from further analysis.
						Ingestion	On-Site	none	
	Groundwater	Groundwater, Air	None	NA	NA	NA	none	none	There are no potable wells or industrial/agricultural wells at the site. All potable water supplied to the surrounding area is from an off-site municipal source that is unaffected by the site. No on-site exposure points for human contact with on-site groundwater was identified in the pathway analysis. Pathways excluded from further analysis.
	Sediment (on-site drainageways)	Sediment	On-Site (drainageways)	Trespasser	Adult	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to sediments in on-site drainageways. Ley Creek sediments not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion	On-Site	Qual	
					Child	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to sediments in on-site drainageways. Ley Creek sediments not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion	On-Site	Qual	
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	No VOCs were identified as COCs in sediments. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	No VOCs were identified as COCs in sediments. Pathway excluded from further analysis.
	Surface Water (on-site drainageways)	Surface Water	On-Site (drainageways)	Trespasser	Adult	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to surface water in on-site drainageways. Ley Creek surface water not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion	On-Site	Qual	
					Child	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to surface water in on-site drainageways. Ley Creek surface water not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion	On-Site	Qual	
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	No VOCs were identified as COCs in surface water. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	No VOCs were identified as COCs in surface water. Pathway excluded from further analysis.

TABLE 9
TOWN OF SALINA LANDFILL
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Leachate	Leachate	On-Site	Trespasser	Adult	Dermal	On-Site	Quant	Historic waste disposal, other contaminated media, leaching/migration of contamination, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
					Child	Dermal	On-Site	Quant	Historic waste disposal, other contaminated media, leaching/migration of contamination, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	Only two VOCs identified as COCs in leachate. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	Only two VOCs identified as COCs in leachate. Pathway excluded from further analysis.
Future	Surface Soil	Surface Soil	On-Site	Trespasser	Adult	Dermal	On-Site	Quant	Historic waste disposal and surface runoff, tracking, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
					Child	Dermal	On-Site	Quant	Historic waste disposal and surface runoff, tracking, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
				Construction Worker	Adult	Dermal	On-Site	Quant	Historic waste disposal and surface runoff, tracking, and spills have created COCs in this medium. Individual conducting future site work may be exposed to surface soil contaminants. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	On-site area anticipated to remain mostly vegetated; generation of fugitive dusts expected to be minimal. No VOCs were identified as COCs in surface soils. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	On-site area anticipated to remain mostly vegetated; generation of fugitive dusts expected to be minimal. No VOCs were identified as COCs in surface soils. Pathway excluded from further analysis.
				Construction Worker	Adult	Inhalation	On-Site	none	On-site area anticipated to remain mostly vegetated; generation of fugitive dusts expected to be minimal. No VOCs were identified as COCs in surface soils. Pathway excluded from further analysis.
	Subsurface Soil	Subsurface Soil	On-Site	Trespasser	Adult	Dermal	On-Site	none	Although potential COCs exist in subsurface soil, no significant exposure routes were identified for trespassers in the future land use scenario. Pathways excluded from further analysis.
						Ingestion	On-Site	none	
					Child	Dermal	On-Site	none	Although potential COCs exist in subsurface soil, no significant exposure routes were identified for trespassers in the future land use scenario. Pathways excluded from further analysis.
						Ingestion	On-Site	none	
				Construction Worker	Adult	Dermal	On-Site	Quant	Historic waste disposal, contaminant leaching/migration, and spills have created COCs in this medium. Individual conducting future site work may be exposed to subsurface soil contaminants. Pathways retained for further analysis.
						Ingestion	On-Site	Quant	

TABLE 9
TOWN OF SALINA LANDFILL
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
	Groundwater	Groundwater	On-Site	Construction Worker	Adult	Ingestion	On-Site	Quant	Individual conducting future site work may be exposed to groundwater contaminants via incidental ingestion. Pathway retained for further analysis.
						Dermal	On-Site	none	It is surmised that appropriate protective clothing/equipment will be utilized by construction worker in the future so that dermal exposure pathway can be eliminated. Pathway thus excluded from further analysis.
		Air	On-Site	Construction Worker	Adult	Inhalation	On-Site	none	Potential exposure to groundwater COCs is anticipated to be of short duration for construction worker in the future. Thus, inhalation pathway not retained for further analysis.
	Sediment (on-site drainageways)	Sediment	On-Site (drainageways)	Trespasser	Adult	Dermal Ingestion	On-Site	Qual	Qualitative discussion provided in text for exposures to sediments in on-site drainageways. Ley Creek sediments not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
					Child	Dermal Ingestion	On-Site	Qual	Qualitative discussion provided in text for exposures to sediments in on-site drainageways. Ley Creek sediments not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
				Construction Worker	Adult	Dermal Ingestion	On-Site	Qual	Qualitative discussion provided in text for exposures to sediments in on-site drainageways. Ley Creek sediments not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	No VOCs were identified as COCs in sediments. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	No VOCs were identified as COCs in sediments. Pathway excluded from further analysis.
				Construction Worker	Adult	Inhalation	On-Site	none	No VOCs were identified as COCs in sediments. Pathway excluded from further analysis.

TABLE 9
TOWN OF SALINA LANDFILL
SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
	Surface Water (on-site drainageways)	Surface Water	On-Site (drainageways)	Trespasser	Adult	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to surface water in on-site drainageways. Ley Creek surface water not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion	On-Site	Qual	
					Child	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to surface water in on-site drainageways. Ley Creek surface water not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion	On-Site	Qual	
				Construction Worker	Adult	Dermal	On-Site	Qual	Qualitative discussion provided in text for exposures to sediments in on-site drainageways. Ley Creek sediments not included in exposure analysis as per previous agreement. Pathways excluded from quantitative analysis.
						Ingestion			
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	No VOCs were identified as COCs in surface water. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	No VOCs were identified as COCs in surface water. Pathway excluded from further analysis.
				Construction Worker	Adult	Inhalation	On-Site	none	No VOCs were identified as COCs in surface water. Pathway excluded from further analysis.
	Leachate	Leachate	On-Site	Trespasser	Adult	Dermal	On-Site	Quant	Historic waste disposal, other contaminated media, leaching/migration of contamination, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion			
					Child	Dermal		Quant	Historic waste disposal, other contaminated media, leaching/migration of contamination, and spills have created COCs in this medium. Pathways retained for further analysis.
						Ingestion			
				Construction Worker	Adult	Dermal	On-Site	none	It is anticipated that leachate will be removed as needed prior to the commencement of future construction activities at the site. Thus, construction worker pathway excluded from further analysis.
						Ingestion			
		Air	On-Site	Trespasser	Adult	Inhalation	On-Site	none	Only two VOCs identified as COCs in leachate. Pathway excluded from further analysis.
					Child	Inhalation	On-Site	none	Only two VOCs identified as COCs in leachate. Pathway excluded from further analysis.
				Construction Worker	Adult	Inhalation	On-Site	none	Only two VOCs were identified as COCs in leachate. Pathway excluded from further analysis. In addition, it is anticipated that leachate will be removed as needed prior to the commencement of future construction activities at the site. Thus, construction worker pathway excluded from further analysis.

TABLE 10
TOWN OF SALINA LANDFILL
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
(Page 1 of 1)

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor	Adjusted Dermal RfD	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ
1,1,1-Trichlorethane	N/A	2.8E-01 (1)	mg/kg-day	100%	2.8E-01 (1)	mg/kg-day	N/A	N/A	EPA-NCEA: N/A	2000
1,1-Dichloroethene	Chronic/Subchronic	9E-03	mg/kg-day	100%	9E-03	mg/kg-day	liver	1000	IRIS:HEAST	12/22/00: 1997
1,2-Dichloroethene (total)	Chronic/Subchronic	9E-03	mg/kg-day	100%	9E-03	mg/kg-day	liver	1000	HEAST: HEAST	1997
Benzene	N/A	3.0E-03 (1)	mg/kg-day	100%	3.0E-03 (1)	mg/kg-day	N/A	N/A	EPA-NCEA: N/A	2000
Chloroethane	N/A	4.0E-01 (1)	mg/kg-day	100%	4.0E-01 (1)	mg/kg-day	N/A	N/A	EPA-NCEA: N/A	2000
Chloromethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Toluene	Chronic	2E-01	mg/kg-day	100%	2E-01	mg/kg-day	liver	1000	IRIS:HEAST	12/22/00: 1997
	Subchronic	2E+00	mg/kg-day	100%	2E+00	mg/kg-day	liver, kidney	100	HEAST: HEAST	06/19/05
Xylenes	Chronic	2E+00	mg/kg-day	100%	2E+00	mg/kg-day	liver	100	IRIS: IRIS	12/22/00
Trichloroethene	N/A	6.0E-03 (1)	mg/kg-day	100%	6.0E-03 (1)	mg/kg-day	N/A	N/A	EPA-NCEA: N/A	2000
Vinyl Chloride	Chronic	3.0E-03	mg/kg-day	100%	3.0E-03	mg/kg-day	liver	30	IRIS: IRIS	12/22/2000
Benzo(a)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(a)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(b)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzo(k)fluoranthene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dibenz(a,h)anthracene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,4-Dichlorobenzene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Naphthalene	Subchronic	2E-02	mg/kg-day	40%	8.0E-03	mg/kg-day	blood	3000	IRIS: IRIS	12/22/00
Aldrin	Chronic	3E-05	mg/kg-day	100%	3E-05	mg/kg-day	liver	1000	IRIS: HEAST	12/22/00: 1997
Arochlor 1248	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arochlor 1260	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic	Chronic/Subchronic	3E-04	mg/kg-day	95%	2.9E-04	mg/kg-day	skin	3	IRIS: HEAST	12/22/00: 1997
Cadmium	Chronic	5E-04	mg/kg-day	4.6%	2.3E-05	mg/kg-day	kidney	10	IRIS: IRIS	12/22/00
Chromium (TOTAL)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manganese	Chronic	1.4E-01	mg/kg-day	100%	1.4E-01	mg/kg-day	CNS	1	IRIS: HEAST	12/22/00: 1997

N/A = Not Applicable

(1) Indicates EPA-NCEA provisional value (derived from Region III RBC Tables 10/5/2000).

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

TABLE 11
TOWN OF SALINA LANDFILL
CANCER TOXICITY DATA -- ORAL/DERMAL

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
1,1,1-Trichlorethane	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1,1-Dichloroethene	6.0E-01	100%	6.0E-01	$(mg/kg\text{-}day)^{-1}$	C	IRIS	12/22/00
1,2-Dichloroethene (total)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzene	5.50E-02	100%	5.50E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/22/00
Chloroethane	2.90E-03	100%	2.90E-03	$(mg/kg\text{-}day)^{-1}$	N/A	EPA - NCEA (1)	2000
Chloromethane	1.30E-02	100%	1.30E-02	$(mg/kg\text{-}day)^{-1}$	C	HEAST	1997
Toluene	N/A	N/A	N/A	N/A	D	IRIS	12/22/00
Xylenes	N/A	N/A	N/A	N/A	D	IRIS	12/22/00
Trichloroethene	1.10E-02	100%	1.10E-02	$(mg/kg\text{-}day)^{-1}$	N/A	EPA - NCEA (1)	2000
Vinyl Chloride	7.20E-01	100%	7.20E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/22/00
Benzo(a)anthracene	7.30E-01	40%	1.83E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS/ EPA-NCEA(1)	2000
Benzo(a)pyrene	7.30E+00	40%	1.83E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	12/22/00
Benzo(b)fluoranthene	7.30E-01	40%	1.83E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS/ EPA-NCEA(1)	2000
Benzo(k)fluoranthene	7.30E-02	40%	1.83E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS/ EPA-NCEA(1)	2000
Dibenz(a,h)anthracene	7.30E+00	40%	1.83E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS/ EPA-NCEA(1)	2000
Indeno(1,2,3-cd)pyrene	7.30E-01	40%	1.83E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS/ EPA-NCEA(1)	2000
1,4-Dichlorobenzene	2.40E-02	40%	6.00E-02	$(mg/kg\text{-}day)^{-1}$	C	HEAST	1997
Naphthalene	N/A	N/A	N/A	$(mg/kg\text{-}day)^{-1}$	C	IRIS	12/22/00
Aldrin	1.70E+01	100%	1.70E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	12/22/00
Arochlor 1248	2.00E+00	96%	2.08E+00	$(mg/kg\text{-}day)^{-1}$	N/A	EPA - NCEA (1)	2000
Arochlor 1260	2.00E+00	96%	2.08E+00	$(mg/kg\text{-}day)^{-1}$	N/A	EPA - NCEA (1)	2000
Arsenic	1.50E+00	95%	1.58E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	12/22/00
Cadmium	N/A	N/A	N/A	N/A	B1	IRIS	12/22/2000
Chromium	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	N/A	N/A	N/A	N/A	B2	IRIS	12/22/00
Manganese	N/A	N/A	N/A	N/A	D	IRIS	12/22/00

IRIS = Integrated Risk Information System
HEAST= Health Effects Assessment Summary Tables
(1) Indicates EPA-NCEA provisional slope factor value derived from Region III RBC Table (10/5/2000).

EPA Group:
- A - Human carcinogen
- B1 - Probable human carcinogen - indicates that limited human data are available
- B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
- C - Possible human carcinogen
- D - Not classifiable as a human carcinogen
- E - Evidence of noncarcinogenicity

Weight of Evidence:
- Known/Likely
- Cannot be Determined
- Not Likely

TABLE 12
TOWN OF SALINA LANDFILL
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	On-Site											
			Benzo(a)anthracene	3.15E-07	N/A	7.20E-06	7.52E-06	Arsenic	skin	6.20E-03	N/A	1.77E-02	2.39E-02
			Benzo(a)pyrene	3.15E-06	N/A	9.36E-05	9.68E-05						
			Benzo(b)fluoranthene	5.12E-07	N/A	1.17E-05	1.22E-05						
			Dibenz(a,h)anthracene	3.90E-07	N/A	8.89E-06	9.28E-06						
			Indeno(1,2,3-cd)pyrene	1.95E-07	N/A	4.45E-06	4.65E-06						
			Arochlor 1248	1.20E-07	N/A	1.60E-06	1.72E-06						
			Arsenic	3.96E-07	N/A	1.14E-06	1.54E-06						
			(total)	5.08E-06		1.29E-04	1.3E-04	(total)		6.20E-03	N/A	1.77E-02	2.39E-02
Leachate	Leachate	On-site	Benzene	5.81E-09	N/A	7.86E-09	1.4E-08	Benzene	N/A	2.50E-04	N/A	3.33E-04	5.83E-04
			1,4-dichlorobenzene	1.47E-09	N/A	2.16E-08	2.31E-08	Manganese	CNS	1.40E-03	N/A	9.40E-05	1.49E-03
			Aroclor 1248	5.56E-08	N/A	1.84E-06	1.90E-06						
			(total)	6.29E-08		1.87E-06	1.9E-06	(total)		1.65E-03	N/A	4.27E-04	2.08E-03

Total Risk Across Surface Soil	1.3E-04
Total Risk Across Leachate	1.9E-06
Total Risk Across All Media and All Exposure Routes	1.4E-04

Total Hazard Index Across All Media and All Exposure Routes	2.60E-02
Total Skin HI =	2.39E-02
Total CNS HI =	1.49E-03

TABLE 13
TOWN OF SALINA LANDFILL
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	On-Site											
			Benzo(a)anthracene	7.99E-08	N/A	6.67E-07	7.47E-07	Arsenic	skin	1.70E-03	N/A	1.82E-03	3.52E-03
			Benzo(a)pyrene	7.99E-07	N/A	8.66E-06	9.46E-06						
			Benzo(b)fluoranthene	1.30E-07	N/A	1.08E-06	1.21E-06						
			Dibenz(a,h)anthracene	9.87E-08	N/A	8.24E-07	9.23E-07						
			Indeno(1,2,3-cd)pyrene	4.94E-08	N/A	4.12E-07	4.61E-07						
			Arochlor 1248	3.04E-08	N/A	1.48E-07	1.78E-07						
			Arsenic	1.00E-07	N/A	1.05E-07	2.05E-07						
			(total)	1.29E-06		1.19E-05	1.3E-05	(total)		1.70E-03	N/A	1.82E-03	3.52E-03
Leachate	Leachate	On-site	Benzene	2.94E-09	N/A	6.55E-09	9.5E-09	Benzene	N/A	1.40E-04	N/A	3.09E-04	4.49E-04
			1,4-dichlorobenzene	7.44E-10	N/A	1.80E-08	1.87E-08	Manganese	CNS	7.80E-04	N/A	8.70E-05	8.67E-04
			Aroclor 1248	2.82E-08	N/A	1.53E-06	1.56E-06						
			(total)	3.19E-08		1.55E-06	1.6E-06	(total)		9.20E-04	N/A	3.96E-04	1.32E-03

Total Risk Across Surface Soil	1.3E-05
Total Risk Across Leachate	1.6E-06
Total Risk Across All Media and All Exposure Routes	1.5E-05

Total Hazard Index Across All Media and All Exposure Routes	4.84E-03
Total Skin HI =	3.52E-03
Total CNS HI =	8.67E-04

TABLE 14
TOWN OF SALINA LANDFILL
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	On-Site											
			Benzo(a)anthracene	3.65E-07	N/A	3.17E-07	6.82E-07	Arsenic	skin	3.60E-02	N/A	3.91E-03	3.99E-02
			Benzo(a)pyrene	3.65E-06	N/A	4.13E-06	7.78E-06						
			Benzo(b)fluoranthene	5.92E-07	N/A	5.15E-07	1.11E-06						
			Dibenz(a,h)anthracene	4.51E-07	N/A	3.92E-07	8.43E-07						
			Indeno(1,2,3-cd)pyrene	2.26E-07	N/A	1.96E-07	4.22E-07						
			Arochlor 1248	1.39E-07	N/A	7.05E-08	2.10E-07						
			Arsenic	4.58E-07	N/A	5.03E-08	5.08E-07						
			(total)	5.88E-06		5.67E-06	1.2E-05	(total)		3.60E-02	N/A	3.91E-03	3.99E-02
Subsurface Soil	Subsurface Soil	On-Site											
			Benzo(a)anthracene	4.04E-07	N/A	3.51E-07	7.6E-07	Arsenic	skin	1.60E-01	N/A	1.72E-02	1.77E-01
			Benzo(a)pyrene	5.50E-06	N/A	6.21E-06	1.2E-05						
			Benzo(b)fluoranthene	1.04E-06	N/A	9.07E-07	1.9E-06						
			Dibenz(a,h)anthracene	7.05E-07	N/A	6.13E-07	1.3E-06						
			Indeno(1,2,3-cd)pyrene	2.45E-07	N/A	2.12E-07	4.6E-07						
			Arochlor 1248	5.41E-05	N/A	2.74E-05	8.2E-05						
			Arsenic	2.01E-06	N/A	2.21E-07	2.2E-06						
			(total)	6.40E-05		3.59E-05	1.0E-04	(total)		1.60E-01	N/A	1.72E-02	1.77E-01
Groundwater	Groundwater	On-site											
			1,1-Dichloroethene	1.67E-06	N/A	N/A	1.7E-06	1,1,1-Trichloroethane	N/A	6.30E-04	N/A	N/A	6.30E-04
			Benzene	4.43E-08	N/A	N/A	4.4E-08	1,1-Dichloroethene	liver	1.10E-02	N/A	N/A	1.10E-02
			Chloroethane	4.59E-09	N/A	N/A	4.6E-09	1,2-Dichloroethene (tot)	liver	9.80E-01	N/A	N/A	9.80E-01
			Chloromethane	1.30E-08	N/A	N/A	1.3E-08	Trichloroethene	N/A	2.20E-02	N/A	N/A	2.20E-02
			Trichloroethene	4.19E-08	N/A	N/A	4.2E-08	Vinyl Chloride	liver	7.40E-02	N/A	N/A	7.40E-02
			Vinyl Chloride	4.56E-06	N/A	N/A	4.6E-06	Benzene	N/A	9.40E-03	N/A	N/A	9.40E-03
			1,4-Dichlorobenzene	1.16E-08	N/A	N/A	1.2E-08	Chloroethane	N/A	1.40E-04	N/A	N/A	1.40E-04
			Aldrin	9.12E-09	N/A	N/A	9.1E-09	Toluene	liver	1.50E-03	N/A	N/A	1.50E-03
			Arochlor 1248	1.69E-07	N/A	N/A	1.7E-07	Xylenes	liver	1.50E-03	N/A	N/A	1.50E-03
			Arsenic	2.66E-06	N/A	N/A	2.7E-06	Naphthalene	blood	1.10E-03	N/A	N/A	1.10E-03
								Aldrin	liver	6.30E-04	N/A	N/A	6.30E-04
								Arsenic	skin	2.10E-01	N/A	N/A	2.10E-01
								Cadmium	kidney	1.30E-01	N/A	N/A	1.30E-01
								Manganese	CNS	4.00E-02	N/A	N/A	4.00E-02
			(total)	9.18E-06	N/A	N/A	9.2E-06	(total)		1.48E+00	N/A	N/A	1.48E+00

Total Risk Across Surface Soil	1.2E-05
Total Risk Across Subsurface Soil	1.0E-04
Total Risk Across Groundwater	9.2E-06
Total Risk Across All Media and All Exposure Routes	1.2E-04

Total Hazard Index Across All Media and All Exposure Routes	1.70E+00
Total Skin HI =	4.27E-01
Total Liver HI=	1.07E+00
Total Kidney HI =	1.30E-01
Total Blood HI =	1.10E-03
Total CNS HI =	4.00E-02

TABLE 15
TOWN OF SALINA LANDFILL
HAZARD CHARACTERIZATION FOR SOIL INVERTEBRATES

ANALYTE		Earthworm TRV (1)	Soil Concentrations (dry weight) Maximum	Soil Concentrations (dry weight) Mean	Hazard Quotients Maximum	Hazard Quotients Mean
VOCs		(mg/kg, dw)	(mg/kg, dw)	(mg/kg, dw)		
	Acetone	---	ND	ND	ND	ND
	Bromoform	---	12	11.14	---	---
	Chlorobenzene	40	ND	ND	ND	ND
SVOCs						
	2-Methylnaphthalene	---	540	424	---	---
	4-Chloroaniline	---	210	360	---	---
	Acenaphthene	---	1000	412	---	---
	Acenaphthylene	---	1800	482	---	---
	Anthracene	---	2500	673	---	---
	Benzo(a)anthracene	---	8800	1988	---	---
	Benzo(a)pyrene	---	8700	1879	---	---
	Benzo(b)fluoranthene	---	13900	3131	---	---
	Benzo(g,h,i)perylene	---	5200	1565	---	---
	Benzo(k)fluoranthene	---	3700	831	---	---
	bis(2-Ethylhexyl)phthalate	---	1360	560	---	---
	Carbazole	---	700	313	---	---
	Chrysene	---	9100	2259	---	---
	Dibenzo(a,h)anthracene	---	960	494	---	---
	Dibenzofuran	---	3700	465	---	---
	Fluoranthene	---	18000	4021	---	---
	Fluorene	30000	1100	387	0.04	0.01
	Indeno(1,2,3-cd)pyrene	---	5000	1549	---	---
	Napthalene	---	670	434	---	---
	Phenanthrene	---	14000	2969	---	---
	Pyrene	---	16000	4638	---	---
	Total PAHs	30000 (2)	105560	28660	**3.52**	0.96
PCBs						
	Aroclor 1248	---	8400	492	---	---
	Aroclor 1260	---	ND	ND	ND	ND
INORGANICS						
	Aluminum	---	13000	7834	---	---
	Arsenic	60	7.00	2.18	0.12	0.04
	Barium	---	530	115	---	---
	Beryllium	---	0.48	0.35	---	---
	Cadmium	20	17.3	6.43	0.87	0.32
	Chromium	0.4	127.1	47	**317.75**	**117.97**
	Cobalt	---	16.5	7.36	---	---
	Copper	50	859.6	91	**17.19**	**1.82**
	Iron	---	19800	14698	---	---
	Lead	500	1163.2	146	**2.33**	0.29
	Manganese	---	557	375	---	---
	Mercury	0.1	2.60	0.63	**26.00**	**6.33**
	Nickel	200	82.3	33	0.41	0.17
	Selenium	70	22.8	12	0.33	0.17
	Silver	---	8.00	2.70	---	---
	Thallium	---	3.60	1.67	---	---
	Vanadium	---	22.4	16	---	---
	Zinc	200	1732.6	219	**8.66**	**1.10**
	Cyanide	---	3.30	1.03	---	---

N/A = Not applicable because compound was not detected in soil.
ND = Not Detected in Soil

(1) Efroymson et al. (1997a)
(2) Value is actually the TRV for fluorene.

TABLE 16
TOWN OF SALINA LANDFILL
FOOD CHAIN MODEL AND HAZARD QUOTIENTS FOR THE AMERICAN ROBIN

Maximum Contaminant Concentrations:

Contaminant	Earthworm Conc.	Soil Max Conc.	Water Max. Conc.	Food Ing. Rate (kg/day)	Soil Ing. Rate (kg/day)	Water Ing. Rate (L/day)	Body Weight (kg)	Area Use Factor	Calculated Dose (mg/kg BW-day, ww)	NOAEL (mg/kg BW-day, ww)	LOAEL (mg/kg BW-day, ww)	HQ NOAEL	HQ LOAEL
Pesticides/PCBs	(ug/kg, ww)	(ug/kg, ww)	(ug/L)										
Total PAHs	ND	98170.8	10	0.117	0.012	0.0108	0.0773	1	0.00140	40	400	0.000035	0.000003
Aroclor 1248	ND	6787	0.14	0.117	0.012	0.0108	0.0773	1	0.00002	0.18	1.8	0.0001	0.00001
Inorganics	(mg/kg, ww)	(mg/kg, ww)	(ug/L)										
Aluminum	4.3	11830	238	0.117	0.012	0.0108	0.0773	1	1843	87.6	175.1	**21.0**	**10.5**
Arsenic	0.36	6.35	ND	0.117	0.012	0.0108	0.0773	1	1.53	2.46	7.38	0.62	0.21
Barium	ND	488	77.8	0.117	0.012	0.0108	0.0773	1	75.7	20.8	41.7	**3.64**	**1.82**
Beryllium	ND	0.44	ND	0.117	0.012	0.0108	0.0773	1	0.07	---	---	---	---
Cadmium	1.1	15.69	ND	0.117	0.012	0.0108	0.0773	1	4.10	1.45	20	**2.83**	0.205
Chromium	ND	109	2.29	0.117	0.012	0.0108	0.0773	1	16.9	0.1	1	**169**	**16.9**
Cobalt	ND	14.32	ND	0.117	0.012	0.0108	0.0773	1	2.22	0.0875	0.875	**25.4**	**2.54**
Copper	0.8	695	12.7	0.117	0.012	0.0108	0.0773	1	109	47	61.7	**2.32**	**1.77**
Iron	23.5	18216	702	0.117	0.012	0.0108	0.0773	1	2864	---	---	---	---
Lead	0.7	1010	5.6	0.117	0.012	0.0108	0.0773	1	158	1.13	11.3	**140**	**14.0**
Manganese	1.2	507	217	0.117	0.012	0.0108	0.0773	1	80.5	977	9770	0.082	0.0082
Mercury	0.05	2.36	ND	0.117	0.012	0.0108	0.0773	1	0.44	0.0064	0.064	**69.07**	**6.91**
Nickel	ND	66.5	2.96	0.117	0.012	0.0108	0.0773	1	10.3	17.6	77.4	0.59	0.13
Selenium	0.65	21.43	ND	0.117	0.012	0.0108	0.0773	1	4.31	0.4	0.8	**10.8**	**5.39**
Silver	ND	7.36	ND	0.117	0.012	0.0108	0.0773	1	1.14	0.3	3	**3.81**	0.38
Thallium	ND	3.42	ND	0.117	0.012	0.0108	0.0773	1	0.53	---	---	---	---
Vanadium	ND	20.6	1.8	0.117	0.012	0.0108	0.0773	1	3.20	0.15	1.5	**21.3**	**2.13**
Zinc	8.3	1400	53.1	0.117	0.012	0.0108	0.0773	1	230	14.5	131	**15.9**	**1.76**
Cyanide	ND	3.1	18.6	0.117	0.012	0.0108	0.0773	1	0.48	0.0143	0.143	**33.8**	**3.38**

Mean Contaminant Concentrations:

Contaminant	Earthworm Conc.	Soil Mean Conc.	Water Mean Conc.	Food Ing. Rate (kg/day)	Soil Ing. Rate (kg/day)	Water Ing. Rate (L/day)	Body Weight (kg)	Area Use Factor	Calculated Dose (mg/kg BW-day, ww)	NOAEL (mg/kg BW-day, ww)	LOAEL (mg/kg BW-day, ww)	HQ NOAEL	HQ LOAEL
Inorganics	(mg/kg, ww)	(mg/kg, ww)	(ug/L)										
Aluminum	4.3	7211	194	0.117	0.012	0.0108	0.0773	1	1126	87.6	175.1	**12.85**	**6.43**
Barium	ND	106	68.1	0.117	0.012	0.0108	0.0773	1	16.4	20.8	41.7	0.791	0.394
Cadmium	1.1	5.87	ND	0.117	0.012	0.0108	0.0773	1	2.58	1.45	20	**1.777**	0.129
Chromium	ND	43.2	1.2	0.117	0.012	0.0108	0.0773	1	6.70	0.1	1	**67.00**	**6.70**
Cobalt	ND	6.79	ND	0.117	0.012	0.0108	0.0773	1	1.05	0.0875	0.875	**12.05**	**1.20**
Copper	0.8	80.5	8.4	0.117	0.012	0.0108	0.0773	1	13.7	47	61.7	0.292	0.222
Lead	0.7	132	3.8	0.117	0.012	0.0108	0.0773	1	21.6	1.13	11.3	**19.09**	**1.91**
Mercury	0.05	0.58	ND	0.117	0.012	0.0108	0.0773	1	0.17	0.0064	0.064	**26.01**	**2.60**
Selenium	0.65	10.9	ND	0.117	0.012	0.0108	0.0773	1	2.67	0.4	0.8	**6.69**	**3.34**
Silver	ND	2.50	ND	0.117	0.012	0.0108	0.0773	1	0.39	0.3	3	**1.29**	0.129
Vanadium	ND	14.5	1.2	0.117	0.012	0.0108	0.0773	1	2.25	0.15	1.5	**14.98**	**1.50**
Zinc	8.3	194	29.8	0.117	0.012	0.0108	0.0773	1	42.7	14.5	131	**2.95**	0.326
Cyanide	ND	0.96	11.16	0.117	0.012	0.0108	0.0773	1	0.15	0.0143	0.143	**10.48**	**1.048**

ND = Not Detected

TABLE 17
TOWN OF SALINA LANDFILL
FOOD CHAIN MODEL AND HAZARD QUOTIENTS FOR THE SHORT-TAILED SHREW

Maximum Contaminant Concentrations:

Contaminant	Earthworm Conc.	Soil Max Conc.	Water Max. Conc.	Food Ing. Rate (kg/day)	Soil Ing. Rate (kg/day)	Water Ing. Rate (L/day)	Body Weight (kg)	Area Use Factor	Calculated Dose (mg/kg BW-day, ww)	NOAEL (mg/kg BW-day, ww)	LOAEL (mg/kg BW-day, ww)	HQ NOAEL	HQ LOAEL
Pesticides/PCBs	(ug/kg, ww)	(ug/kg, ww)	(ug/L)										
Total PAHs	ND	98171	10	0.0093	0.001034	0.003	0.015	1	0.00200	1	10	0.002	0.0002
Aroclor 1248	ND	6787	0.14	0.0093	0.001034	0.003	0.015	1	0.00003	0.01	0.1	0.003	0.0003
Inorganics	(mg/kg, ww)	(mg/kg, ww)	(ug/L)										
Aluminum	4.3	11830	238	0.0093	0.001034	0.003	0.015	1	818	1.93	19.3	**423.7**	**42.37**
Arsenic	0.36	6.35	ND	0.0093	0.001034	0.003	0.015	1	0.7	0.126	1.26	**5.24**	0.52
Barium	ND	488	77.8	0.0093	0.001034	0.003	0.015	1	33.6	5.1	19.8	**6.59**	**1.70**
Beryllium	ND	0.44	ND	0.0093	0.001034	0.003	0.015	1	0.03	0.66	6.6	0.045	0.0045
Cadmium	1.1	15.7	ND	0.0093	0.001034	0.003	0.015	1	1.8	1.0	10	**1.76**	0.176
Chromium	ND	109	2.29	0.0093	0.001034	0.003	0.015	1	7.5	2737	27370	0.0027	0.00027
Cobalt	ND	14.3	ND	0.0093	0.001034	0.003	0.015	1	1.0	3	30	0.33	0.033
Copper	0.8	695	12.7	0.0093	0.001034	0.003	0.015	1	48.4	11.7	15.1	**4.14**	**3.20**
Iron	23.5	18216	702	0.0093	0.001034	0.003	0.015	1	1270	---	---	---	---
Lead	0.7	1010	5.6	0.0093	0.001034	0.003	0.015	1	70	8.0	80	**8.75**	0.875
Manganese	1.2	507	217	0.0093	0.001034	0.003	0.015	1	35.7	88	284	0.41	0.126
Mercury	0.05	2.36	ND	0.0093	0.001034	0.003	0.015	1	0.2	0.032	0.16	**6.05**	**1.210**
Nickel	ND	66.5	2.96	0.0093	0.001034	0.003	0.015	1	4.6	40	80	0.115	0.057
Selenium	0.65	21.4	ND	0.0093	0.001034	0.003	0.015	1	1.9	0.2	0.33	**9.39**	**5.69**
Silver	ND	7.36	ND	0.0093	0.001034	0.003	0.015	1	0.5	0.1	1.0	**5.07**	0.507
Thallium	ND	3.42	ND	0.0093	0.001034	0.003	0.015	1	0.24	0.0074	0.074	**31.84**	**3.18**
Vanadium	ND	20.6	1.8	0.0093	0.001034	0.003	0.015	1	1.4	0.21	2.1	**6.76**	0.676
Zinc	8.3	1400	53.1	0.0093	0.001034	0.003	0.015	1	102	160	320	0.64	0.32
Cyanide	ND	3.1	18.6	0.0093	0.001034	0.003	0.015	1	0.2	0.023	0.23	**9.45**	0.945

Mean Contaminant Concentrations:

Contaminant	Earthworm Conc.	Soil Mean Conc.	Water Mean Conc.	Food Ing. Rate (kg/day)	Soil Ing. Rate (kg/day)	Water Ing. Rate (L/day)	Body Weight (kg)	Area Use Factor	Calculated Dose (mg/kg BW-day, ww)	NOAEL (mg/kg BW-day, ww)	LOAEL (mg/kg BW-day, ww)	HQ NOAEL	HQ LOAEL
Inorganics	(mg/kg, ww)	(mg/kg, ww)	(ug/L)										
Aluminum	4.3	7211	194	0.0093	0.001034	0.003	0.015	1	500	1.93	19.3	**258.83**	**25.88**
Arsenic	0.36	1.98	ND	0.0093	0.001034	0.003	0.015	1	0.36	0.126	1.26	**2.85**	0.29
Barium	ND	106	68.1	0.0093	0.001034	0.003	0.015	1	7.31	5.1	19.8	**1.43**	0.37
Cadmium	1.1	5.87	ND	0.0093	0.001034	0.003	0.015	1	1.09	1.0	10	**1.09**	0.11
Copper	0.8	80.50	8.4	0.0093	0.001034	0.003	0.015	1	6	11.7	15.1	0.52	0.40
Lead	0.7	132	3.8	0.0093	0.001034	0.003	0.015	1	9.54	8.0	80	**1.19**	0.12
Mercury	0.05	0.58	ND	0.0093	0.001034	0.003	0.015	1	0.07	0.032	0.16	**2.23**	0.45
Selenium	0.65	10.89	ND	0.0093	0.001034	0.003	0.015	1	1.15	0.2	0.33	**5.77**	**3.49**
Silver	ND	2.50	ND	0.0093	0.001034	0.003	0.015	1	0.17	0.1	1.0	**1.72**	0.17
Thallium	ND	1.55	ND	0.0093	0.001034	0.003	0.015	1	0.11	0.0074	0.074	**14.43**	**1.44**
Vanadium	ND	14.47	1.2	0.0093	0.001034	0.003	0.015	1	1.00	0.21	2.1	**4.75**	0.47
Cyanide	ND	0.96	11.16	0.0093	0.001034	0.003	0.015	1	0.07	0.023	0.23	**2.96**	0.30

ND = Not Detected

TABLE 18 Cost Estimate Input Data for Selected Remedy - Alternative 2
Part 360 Cap North of Ley Creek and South Ley Creek,
and Groundwater/Leachate Collection North AND South of Ley Creek
and Treatment at an On-Site Treatment Plant (Page 1 of 3)

Description	Unit Cost	Unit	Quantity	Cost
CAPITAL COSTS				
Fencing North of Ley Creek				$94,685
Medium brush, average grub, some trees	$455.00	ACRE	2	$910
Fence, chain link industrial, schedule 40, 8' high, 6 ga. wire	$30.50	LF	3,000	$91,500
Double swing gates, incl. Post and hardware 8' high, 20' wide	$2,275.00	EA	1	$2,275
Fencing South of Ley Creek				$8,375
Fence, chain link industrial, schedule 40, 8' high, 6 ga. wire	$30.50	LF	200	$6,100
Double swing gates, incl. Post and hardware 8' high, 20' wide	$2,275.00	EA	1	$2,275
Groundwater/leachate Collection Trench North of Ley Creek				$2,074,924
Medium brush, average grub, some trees	$455.00	ACRE	5	$2,275
Medium brush, medium trees, clear, grub, haul	$4,567.00	ACRE	2	$9,134
Cut & chip medium trees -12" diam.	$4,250.00	ACRE	2	$8,500
Erosion controls (silt fence and haybales)	$9.00	LF	3,550	$31,950
Work pad preparation (grading 7 acres and staging excess soil/waste)	$10.00	CY	16,700	$167,000
Collection trench (incl. HDPE liner, backfill, and perf. HDPE pipe)	$15.00	SF	40,600	$609,000
Conveyance trench (incl. backfill and HDPE pipe)	$13.00	SF	12,350	$160,550
Sumps and clean-outs	$2,000.00	EA	6	$12,000
Grading and drying of trench spoils	$5.00	CY	4,900	$24,500
Characterization of excess soil/waste (including trench spoils)	$370.00	100 CY	122	$45,140
% of soil/waste with > 50 ppm PCBs (or RCRA hazardous)	NA	%	25%	NA
Transportation and off-site disposal of soil/waste	$265.50	CY	3,050	$809,775
Connections to sewer system manholes	$21,000.00	EA	2	$42,000
Topsoil (0.5' over 7 acres)	$20.00	EA	6,780	$135,600
Establish Vegetation	$2,500.00	EA	7	$17,500
Groundwater/leachate Collection Trench South of Ley Creek				$806,199
Medium brush, medium trees, clear, grub, haul	$4,567.00	ACRE	2	$9,134
Cut & chip medium trees -12" diam.	$4,250.00	ACRE	2	$8,500
Erosion controls (silt fence and haybales)	$9.00	LF	1,260	$11,340
Work pad preparation (grading 2 acres and staging excess soil/waste)	$10.00	CY	5,700	$57,000
Collection trench (incl. HDPE liner, backfill, and perf. HDPE pipe)	$15.00	SF	17,640	$264,600
Sumps and clean-outs	$2,000.00	EA	2	$4,000
Grading and drying of trench spoils	$5.00	CY	1,700	$8,500
Characterization of excess soil/waste (including trench spoils)	$370.00	100 CY	54	$19,980
% of soil/waste with > 50 ppm PCBs (or RCRA hazardous)	NA	%	25%	NA
Transportation and off-site disposal of soil/waste	$265.50	CY	1,350	$358,425
Connections to sewer system manholes	$21,000.00	EA	1	$21,000
Topsoil (0.5' over 2 acres)	$20.00	CY	1,936	$38,720
Establish vegetation	$2,500.00	ACRE	2	$5,000
Grading of Relocated Soil/Waste				$44,880
Grading of relocated waste in main landfill (over approx. 5 acres)	$3.00	CY	14,960	$44,880

TABLE 18 Cost Estimate Input Data for Selected Remedy - Alternative 2
Part 360 Cap North of Ley Creek and South Ley Creek,
and Groundwater/Leachate Collection North AND South of Ley Creek
and Treatment at an On-Site Treatment Plant (Page 2 of 3)

Part 360 Cap North of Ley Creek (over 49 acres)				$6,606,153
Medium brush, average grub, some trees	$455.00	ACRE	37	$16,835
Medium brush, medium trees, clear, grub, haul	$4,567.00	ACRE	3	$13,701
Cut & chip medium trees -12" diam.	$4,250.00	ACRE	3	$12,750
Erosion controls (silt fence and haybales)	$9.00	LF	7,060	$63,540
Rough grading of subgrade (over 32 acres)	$2.70	SY	154,880	$418,176
Non-woven geotextile (over 49 acres)	$1.00	SY	237,160	$237,160
Gas venting layer (1' sand over 49 acres)	$12.00	CY	79,053	$948,636
60 mil HDPE liner (over 49 acres)	$0.75	SF	2,134,440	$1,600,830
Composite drainage net (over sloped areas, assume 50% or 24.5 acres)	$0.75	SF	1,067,220	$800,415
Barrier protection layer (2' common fill over 49 acres)	$10.00	CY	158,107	$1,581,070
Topsoil (0.5' over 49 acres)	$20.00	CY	39,527	$790,540
Establish vegetation	$2,500.00	ACRE	49	$122,500
Part 360 Cap South of Ley Creek (over 4 acres)				$445,303
Medium brush, medium trees, clear, grub, haul	$4,567.00	ACRE	1	$4,567
Cut & chip medium trees-12"diam.	$4,250.00	ACRE	1	$4,250
Erosion controls (silt fence and haybales)	$9.00	LF	2,600	$23,400
Rough grading of subgrade (over 4 acres)	$2.70	SY	19,360	$52,272
Non-woven geotextile (over 4 acres)	$1.00	SY	19,360	$19,360
Gas venting layer (1" sand over 4 acres)	$12.00	CY	3,227	$38,724
60 mil HDPE liner (over 4acres)	$0.75	SF	174,240	$130,680
Composite drainage net (over sloped areas, assume 50% or 2 acres)	$0.75	SF	87,120	$65,340
Barrier protection layer (2' common fill over 4 acres)	$10.00	CY	3,227	$32,270
Topsoil (0.5' over 4 acres)	$20.00	CY	3,222	$64,440
Establish vegetation	$2,500.00	ACRE	4	$10,000
Engineered Drainage Controls				$564,850
Seal ends of 48-inch abandoned sewer line	$10,000.00	LS	1	$10,000
Install slip liner in 48-inch CMP	$80,000.00	LS	1	$80,000
Sediment Removal from West Drainage Ditch	$75.00	CY	350	$26,250
Line drainage swales with synthetic liner	$1.30	SF	72,000	$93,600
Wetlands mitigation	$50,000.00	ACRE	7.1	$355,000
			Capital Costs Subtotal	$10,645,369
			Mob/Demob, General Conditions (3%)	$319,361
			Engineering Consulting Services (6%)	$638,722
			Construction Inspection (3%)	$319,361
			Legal and Administrative (3%)	$319,361
			Capital Costs Total	$12,242,174
ANNUAL COSTS				
Maintenance to collection trench	$5,000.00	LS	1	$5,000
Cap Repairs	$100.00	Acre	53	$5,300
Mowing	$6,000.00	LS	1	$6,000
Annual Groundwater/leachate sampling	$23,000.00	LS	1	$23,000
Annual surface water and sediment sampling	$10,500.00	LS	1	$10,500
Monitoring summary report	$5,000.00	EA	1	$5,000
Quarterly site inspection	$2,000.00	EA	4	$8,000
Quarterly report	$2,000.00	EA	4	$8,000
Annual report	$1,000.00	EA	1	$1,000
Annual repairs to fence	$5,000.00	LS	1	$5,000
			Annual Costs Total	$76,800
			Present Worth of Annual Costs Assuming 30 Years and 7% Discount Rate	$ 953,014
			Total Present Worth	**$13,195,000**

TABLE 18 Cost Estimate Input Data for Selected Remedy - Alternative 2
Part 360 Cap North of Ley Creek and South Ley Creek,
and Groundwater/Leachate Collection North AND South of Ley Creek
and Treatment at an On-Site Treatment Plant (Page 3 of 3)

ON-SITE TREATMENT PLANT

CAPITAL COSTS				
Forcemain from south side P.S. to Treatment Plant Site	$ 75.00	FT	1,100	$ 82,500
Pump Station (with emergency power)	$ 200,000.00	EA	2	$ 400,000
Creek Crossing	$ 10,000.00	LS	1	$ 10,000
Sewerline to treatment plant site	$ 75.00	FT	600	$ 45,000
PACT Pre-Treatment System	$ 1,200,000.00	LS	1	$ 1,200,000
Sludge Dewatering Belt Filter Press	$ 325,000.00	LS	1	$ 325,000
Reverse Osmosis Facility	$ 1,600,000.00	LS	1	$ 1,600,000
Gravel Access Road	$ 25.00	SY	4,100	$ 102,500
150,000 Gallon Storage Tank	$ 300,000.00	LS	1	$ 300,000
Site Restoration/Fencing	$ 40,000.00	LS	1	$ 40,000
Outfall Discharge Pipe	$ 75.00	FT	200	$ 15,000
Outfall Structure	$ 10,000.00	LS	1	$ 10,000
Subtotal				$ 4,130,000
Mob/Demob (5%)				$ 206,000
Engineering, Legal and Administrative (20%)				$ 826,000
Subtotal				$ 5,162,000
Contingencies (20%)				$ 1,032,000
Total Project Capital Cost				$ 6,194,000
ANNUAL O & M				
Monitoring	$ 1,000.00	Month	12	$ 12,000
Labor	$ 35.00	HR	2,080	$ 72,800
Electric Power	$ 68,000.00	LS	1	$ 68,000
Lab Testing	$ 3,000.00	LS	1	$ 3,000
Materials and Supplies	$ 7,000.00	LS	1	$ 7,000
Chemicals	$ 86,000.00	LS	1	$ 86,000
Dewatered Sludge Hauling	$ 20,000.00	LS	1	$ 20,000
R.O. Membrane Replacement	$ 2.88	1000 GAL	21,900	$ 63,100
Total Annual O & M Cost				$ 331,900
PRESENT WORTH				
Present Worth of Annual O & M Cost (P/A=12.409 @ 7% for 30 yrs.)				$ 4,118,000
Total Project Capital Cost				$ 6,194,000
Total Project Present Worth				**$ 10,312,000**

Assumptions: Q=60,000 gpd= 42 gpm

TOTAL $ 23,507,000

APPENDIX III

Administrative Record Index

Administrative Record Index
Town of Salina Landfill Site

(New York State Inactive Hazardous Waste Disposal Site #7-34-036)

RI/FS Activities	Document*
Pre-Remedial Investigation Information	Preliminary Site Assessment, Task 1, Town of Salina Landfill, Salina, New York (July 1992) Preliminary Site Assessment, Volume 1, Town of Salina Landfill, Salina, New York (May 1994) Public Health Assessment of Onondaga Lake by the New York State Department of Health (July 24, 1995) Public Health Assessment of Onondaga Lake by the US Dept. of Health & Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (July 24, 1995) Citizen Participation Plan for the Onondaga Lake National Priority List Site (January 1996) Preliminary Site Assessment, Addendum, Town of Salina Landfill, Salina, New York (March 1996)
Remedial Investigation / Feasibility Study Work Plan Approved	Work Plan for the Remedial Investigation/Feasibility Study, Town of Salina Landfill, Salina, New York (May 1998) Volume I: Work Plan Health and Safety Plan Field Sampling Plan Quality Assurance Project Plan Citizen Participation Plan Volume II: Budget Remedial Investigation for the Town of Salina Landfill Site, Salina, New York, Data Summary Report (November 1998) Fact Sheet, Remedial Investigation at the Town of Salina Landfill, Salina, New York (February 1999)

Feasibility Study Started Remedial Investigation Completed	Technical Memorandum, Environmental Risk Assessment, Remedial Investigation/Feasibility Study, Town of Salina Landfill, Salina, New York (April 1999) Work Plan for the Phase II Investigation, Remedial Investigation/Feasibility Study, Town of Salina Landfill, Salina, New York (July 1999) Volume I: Technical Work Plan Volume II: Work Plan Budget Remedial Investigation for the Town of Salina Landfill Site, Salina, New York (December 2000) Volume I: Main Text, Tables, and Figures Volume II: Appendices
   Feasibility Study Completed	Feasibility Study Memorandum, Remedial Investigation/Feasibility Study, Town of Salina Landfill, Salina, New York (June 2000) Feasibility Study Report for the Town of Salina Landfill Site, Salina, New York (May 2002)
Proposed Plan Released Start of Public Comment Period	Proposed Plan (January 2003) Fact Sheets of Public Meeting and Opportunity to Comment (January 2003)
Public Meeting Held	Documentation and Transcript of Meeting (Attached to the Record of Decision) Written Comments on Selected Remedy Submitted by Atlantic States Legal Foundation, Inc., General Motors, Onondaga County, Onondaga Nation, Solvents and Petroleum Service, Inc., and the public (Attached to the Record of Decision)
Close of Public Comment Period	Extension of the Public Comment Period (February 2003)
Addendum to the Feasibility Study Started	Letter from NYSDEC, Region 7 (July 2004)

Addendum to the Feasibility Study Completed	Addendum to the May 2002 Feasibility Study Report for the Town of Salina Landfill Site, Salina, New York (September 2006)
Revised Proposed Plan Released Start of Public Comment Period	Revised Proposed Plan (December 2006) Fact Sheets of Public Meeting and Opportunity to Comment (December 2006)
Public Meeting Held	Documentation and Transcript of Meeting (Attached to the Record of Decision) Written Comments on Selected Remedy Submitted by Atlantic States Legal Foundation, Inc., General Motors, National Grid, Onondaga Nation, Pipevision Products, Inc., and the public (Attached to the Record of Decision)
Close of Public Comment Period Record of Decision Issued	 Record of Decision and Responses to Comments - Responsiveness Summary - (March 29, 2007)
Enforcement Documents	RI/FS Consent Decree for the Onondaga Lake Sediments (March 16, 1992) Section 104(e) Letters to, and responses from, Town of Salina, New York (June 1995) RI/FS Consent Order for the Town of Salina Landfill Site, Salina, New York (October 1997)

* Data are summarized in several of these documents. The actual data, QA/QC, chain of custody, etc. are compiled at various NYSDEC office locations and can be made available at the NYSDEC Region 7 office upon request. Bibliographies in these documents and in the references cited in this Record of Decision are incorporated by reference in the Administrative Record. Many of the documents referenced in the bibliographies are publicly available and readily accessible. Most of the guidance documents referenced in the bibliographies are available on EPA or NYSDEC websites. If copies of the referenced documents cannot be located, contact the NYSDEC Project Manager (David Tromp, 518-402-9786). Copies of administrative record documents that are not available in the administrative record files in the NYSDEC Region 7 office or at Atlantic States Legal Foundation can be made available at one of those locations upon request.

APPENDIX IV

NYSDOH Letter of Concurrence

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square, 547 River Street, Troy, New York 12180-2216

Antonia C. Novello, M.D., M.P.H., Dr.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

March 29, 2007

Mr. Dale Desnoyers, Director
Division of Environmental Remediation
NYS Dept. of Environmental Conservation
625 Broadway – 12th Floor
Albany, NY 12233-7011

RE: Record of Decision
Town of Salina Landfill
Site #734036
Salina (T), Onondaga County

Dear Mr. Desnoyers:

Staff reviewed the March 2007 draft Record of Decision for the Town of Salina Landfill in Onondaga County. Based upon that review, I understand that the selected remedy includes: construction of a 6 NYCRR Part 360 cap over landfill areas north and south of Ley Creek; excavation of contaminated sediments in the western drainage ditch; construction of groundwater/leachate collection trenches north and south of Ley Creek; consolidation of excavated sediments, soils and wastes on the landfill north of Ley Creek; lining of drainage ditches along the northern and eastern borders of the site and engineered drainage controls and fencing. In addition, institutional controls in the form of deed restrictions prohibiting residential use of the property and prohibiting the installation and use of groundwater wells, and an operation and maintenance plan are included. If agreement between the Town of Salina and Onondaga County can be reached, leachate collected at the site will be pre-treated on-site and accepted by the Onondaga County wastewater treatment facility. If an agreement cannot be reached, leachate will be completely treated at an on-site facility and released into Ley Creek.

Based on this information, I believe the selected remedy is protective of public health and concur with it. If you have any questions, please call Mark VanValkenburg at (518) 402-7860.

Sincerely,

Steven M. Bates

Steven M. Bates, Assistant Director
Bureau of Environmental Exposure Investigation

Mr. Dale Desnoyers
Site #734036
March 29, 2007

cc: G.A. Carlson, Ph.D./A. Grey, Ph.D.
G. Litwin/M. VanValkenburg/File
H. Hamel - CNYRO
G. Sauda - OCHD
G. Townsend - DEC Region 7

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APPENDIX V

Statement of Findings:
Wetlands & Floodplains

Appendix V

Record of Decision

Salina Landfill Sub-Site of the Onondaga Lake Superfund Site

Statement of Findings: Floodplains and Wetlands

Need to Affect Floodplains and Wetlands

Wetlands on or adjacent to the site can be seen in Figure 1. Wetland 1 is a shallow emergent marsh located on the western edge of the project area and straddles a drainage ditch which discharges to Ley Creek. Wetland 2 is a narrow wetland dominated by giant reed located on the northern edge of the project, adjacent to the New York State Thruway. Wetland 4 is a small wetland located adjacent to the Old Ley Creek Channel. Wetland 5 is a shallow emergent march located along the banks of Ley Creek.[1]

As discussed in the Feasibility Study (FS) report, an examination of applicable floodplains mapping indicates that portions of the Site, including some disposal areas, are located inside of the 500-year floodplain as designated by the Federal Emergency Management Agency.

Based upon the human health and ecological risk assessments and the fact that groundwater containing hazardous substances in excess of groundwater standards discharge unabated into Onondaga Lake, NYSDEC and EPA have determined that the Site poses an unacceptable threat which warrants remediation.

The response action described in this Record of Decision is necessary to address hazardous waste materials in the Town of Salina Landfill and the contaminated groundwater associated with the leaching of these materials. The response action will achieve the following remedial action objectives established for the Site:

- Reduce/eliminate contaminant leaching to ground water;
- Control surface water runoff and erosion;
- Prevent the off-Site migration of contaminated groundwater and leachate;

1

Wetland 3 consists of a monotypic stand of giant reeds located on top of the existing landfill cover material. Inspections conducted at the Site have determined that this area does not have the characteristics of a wetland (hydric soils, vegetation, and hydrology).

- Restore groundwater quality to levels which meet state and federal drinking-water standards;

- Prevent human contact with contaminated soils, sediment and ground water; and

- Minimize exposure of aquatic species and wildlife to contaminants in surface water, sediments, and soils.

The major components of the selected remedy include:

- Construction of groundwater/leachate collection trenches north and south of Ley Creek;

- Excavation of contaminated sediments in the western drainage ditch;

- Lining the drainage ditches located along the northern and eastern borders of the Site;

- Consolidation of the excavated sediments and the soils and wastes (from the excavation of the collection trenches) on the landfill area north of Ley Creek, as appropriate;

- Construction of 6 New York State Codes, Rules and Regulations (NYCRR) Part 360 caps over the landfill area north and south of Ley Creek;

- Engineered drainage controls and fencing;

- Installation of an on-Site, 150,000-gallon storage tank to hold excess water volume from the groundwater/leachate collection trench(es) stemming from storm events;

- Treatment of the collected contaminated groundwater/leachate at an on-Site treatment plant;

- Discharge of treated effluent to Ley Creek;

- Institutional controls;

- Operation and maintenance of the on-Site treatment plant and maintenance of the cap and groundwater/leachate collection trench(es); and

- Long-term monitoring.

Effects of Proposed Action on the Natural and Beneficial Values of Floodplains and Wetlands

Under the selected remedy, sediments in the western drainage ditch will be excavated and the area restored, allowing for positive drainage of surface water runoff to Ley Creek. Given the proximity of this wetland (Wetland 1) to Ley Creek, its primary function is likely to be to provide flood control.

The drainage ditches located along the northern and eastern borders of the Site will be lined with a low permeability material. The liner will be covered with either riprap or soil, depending on the expected surface water velocity. The primary function of this wetland (Wetland 2) appears to be to collect and convey stormwater runoff from the New York State Thruway and adjacent upland areas. These drainage ditches will be designed so as to allow surface water runoff to flow through the Site without coming in contact with contaminated sediments.

The consolidation of excavated material in the landfill and the construction of the landfill multi-media caps would alter the topography of the landfill and could potentially increase soil volume in the floodplain. However, part of the banks of landfill have steep slopes and may need to be regraded to meet maximum slope requirements under 6 NYCRR Part 360. This would result in the removal of soil volume in the floodplain, which may offset an increase in soil volume resulting from the consolidation of materials and the placement of the landfill caps. The effects of the consolidation of materials and the construction of the caps on the flood carrying potential of the floodplain will need to be evaluated during the remedial design.

Compliance with Applicable State or Local Wetland and Floodplain Protection Standards

Consistent with 40 CFR Part 6 Appendix A[2], "Statement of Procedures on Floodplains Management & Wetlands Protection," all Site wetlands will be delineated consistent with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989). In accordance with 40 CFR Part 6, Appendix A, Executive Order 11990, "Protection of Wetlands," and EPA's 1985 Statement of "Policy on Floodplains/Wetlands Assessments for CERCLA Actions," a wetlands assessment will be developed for project area wetlands which will be impacted by remedial activities.

The primary New York State standard for protection of freshwater wetlands applicable to the remediation is Environmental Conservation Law, Article 24, Title 7. For freshwater

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2 EPA has proposed regulations (71 Fed. Reg. 76082, 76086 (December 19, 2006)) that would rescind Appendix A and replace it with a general procedural requirement to determine the applicability, among other things, of Executive Orders 11988 and 11990. For purposes of this ROD, assessment of floodplain management and wetlands protection were made pursuant to Appendix A which remained in effect as of the date of the ROD.

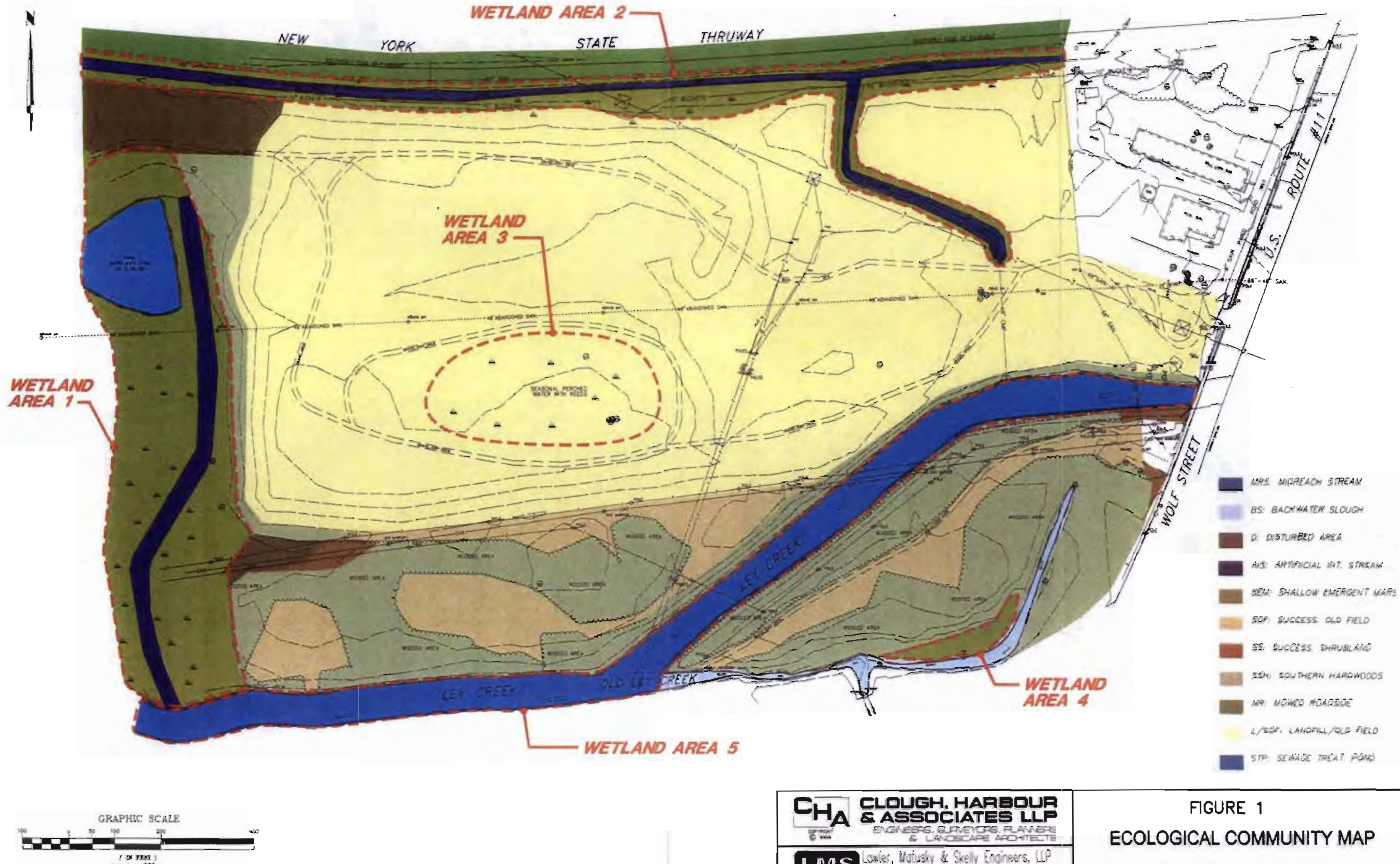
wetlands, 6 NYCRR Parts 662 through 665 regulate activities conducted in or adjacent to regulated wetlands. The selected remedy will comply with this standard.

Since remedial activities will take place within the 100- or 500-year floodplain, a floodplain assessment consistent with Executive Order 11988: "Floodplain Management," and 40 CFR Part 6, Appendix A will be performed to minimize or avoid the adverse effects of a 500-year event, as well as to protect against the spread of contaminants and the long-term disabling of remedial treatment systems due to flooding events. In addition, the substantive requirements of Title 6 of NYCRR Part 502, Floodplain Management Criteria for State Projects will also need to be met.

Measures to Mitigate Potential Harm to the Floodplains and Wetlands

Implementation of the selected remedy will include the excavation of sediments, soils and wastes during construction of groundwater/leachate collection trenches north and south of Ley Creek and excavation of contaminated sediments in the western drainage ditch. These actions will result in temporary physical disturbances to the wetlands and floodplains. Measures to minimize potential adverse impacts that cannot be avoided will be evaluated as part of, and incorporated into, the remedial design. Common practices include field demarcation of wetland/floodplain areas and implementation of soil/sediment erosion and/or resuspension control measures (e.g., installation of silt fencing, hay bales, hay/straw mulch, jute matting) to minimize impacts from construction activities. In addition, the FS Report notes that western drainage ditch receives surface water runoff from the western portion of the Site as well as from the eastern area of the Onondaga County Resource Recovery Agency transfer station to the west of the Wetland 1. Surface water drainage to this wetland from the Site will be evaluated, and if needed, incorporated into the remedial design, so as to maintain desired water levels for the wetland.

The selected remedy also includes lining of drainage ditches located along the eastern and northern borders of the site. This action will likely result in the loss of wetlands in or adjacent to these ditches, and mitigation for this loss will be necessary.



CLOUGH, HARBOUR & ASSOCIATES LLP
ENGINEERS, SURVEYORS, PLANNERS & LANDSCAPE ARCHITECTS

LMS Lawler, Matusky & Skelly Engineers, LLP
Environmental Science & Engineering Consultants

FIGURE 1

ECOLOGICAL COMMUNITY MAP

TOWN OF SALINA LANDFILL